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Final report
The implementation of the Water Framework Directive

a focused comparison of governance arrangements to improve water quality

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    - spatial differentiation of policies and measures,
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1. Introduction

This document is the final report of the research project 'The implementation of the Water Framework Directive – a focused comparison of governance arrangements to improve water quality'. The report explores experiences with regard to the implementation of the Water Framework Directive (WFD) in selected European Union (EU) Member States with the aim to draw lessons for the implementation of the WFD in the Netherlands. It was commissioned by the Netherlands Environmental Assessment Agency (*Planbureau voor de Leefomgeving*, PBL) as a background study for the final implementation phase of the WFD (2021-2027). The project was carried out by the Chair Group 'Political Sciences of the Environment' in the Department of Geography, Planning and Environment, at Radboud University Nijmegen (project leader: dr. Mark Wiering).

The project started in early October 2017 and took place in three phases. In a short first phase (October - November 2017) we conducted a **quick scan** of the implementation of the WFD in five EU Member States: Austria, Belgium (with focus on Flanders), Denmark, Germany (with focus on Lower Saxony) and Ireland. The country selection will be discussed in more detail below. The quick scan led to a longlist of policy issues that, considering the experiences in those countries, might be interesting in view of lesson-drawing for the Netherlands. Based, among other things, on the outcomes of an expert workshop held in Utrecht on 21 November 2017, three issues were selected for closer investigation in the second project phase (November 2017 - March 2018). This phase involved **in-depth study** of relevant policy documents and academic literature as well as interviews with policy makers and stakeholders in the selected countries. In the third and final project phase (March - April 2018) it was assessed to what extent and under which conditions the foreign experiences found in the previous phase could actually serve as **lessons** and be transferred to the Dutch situation. Important input for this assessment was given at a second workshop with both Dutch and foreign experts held in Nijmegen on 12 April 2018.

The project can be seen as a follow-up to another project commissioned by PBL and carried out by the Chair Group 'Political Sciences of the Environment' at Radboud University Nijmegen together with the Centre for Environmental Law and Policy (NILOS) at Utrecht University in 2009. That project was entitled ´Dealing with complexity and policy discretion. A comparison of the implementation process of the European Water Framework Directive in five Member States (see Uitenboogaart et al. 2009; see also Liefferink et al. 2011; Bourblanc et al. 2013). Apart from the Netherlands, the countries covered by the earlier study were France, Denmark, Germany, Belgium and the UK. The present projects is more focused than the previous one in at least three important respects. First, whereas the 2009 project aimed at giving a broad overview of the process of WFD in the selected countries, the present project focuses on specific key issues, related in particular to problems of **intensive agriculture and nutrients**. Second, while the 2009 project combined political, institutional and juridical perspectives, the present project focuses on the **political** choices and the **institutional** organisation underlying the implementation of the WFD. Third, rather than 'mapping' policies in surrounding Member States, the present project is explicitly aimed at drawing **lessons** for the Netherlands

From the beginning of the project we maintained close contact with a network of WFD experts in the selected countries (see Annex 1). They assisted us in identifying documents and interview partners and

acted as sparring partners throughout the project, among other things. Some of the experts participated in the final workshop in April 2018.

2. Problem context and core questions

This section starts by sketching the problem context for this project. This leads to a brief description of the research approach and the basic conceptual choices related to that, and finally to a formulation of the core research questions.

2.1. Problem context and research approach

The WFD can be considered a modern EU Directive in different ways. It is a Directive which builds on preceding water regulations and collects and integrates formerly separated parts of European water policies. It is a framework Directive which gives general normative and organisational principles and procedures. Furthermore, and consequentially, it does not (always) prescribe Members States what to do. Especially when it comes to realizing the ecological quality of water bodies, the WFD largely depends on mechanisms of, on the one hand, **self-disciplining** and, on the other hand, **monitoring and accountability**. In other words, to a large extent countries decide themselves how to achieve a good status of water bodies. They are expected to self-assess their ambitions as well as the financial, economic and social feasibility of measures, to find the means to close the gap between the existing and the desired situation, and to monitor the results. This process leaves **strong degrees of freedom and discretion** to the Member States (Uitenboogaart et al. 2009). At the same time, this reliance on self-disciplining is not a voluntary or non-binding process. Member states will be held accountable for reaching a good chemical and ecological quality of water bodies throughout the country.

This discretionary freedom is highly relevant for both the **substantial** and the **organisational** aspects of the implementation of the WFD (for a systematic discussion of both aspects, see Liefferink et al. 2011). All Member States have made choices aimed at generating both feasible and effective programs of measures, for instance by setting general and specific goals, prioritising certain issues or target groups, and putting emphasis on either source-oriented or effect-oriented measures. In addition to this, member states have considerable freedom in selecting particular types of policy instruments. The literature commonly distinguishes between 'sermons' (knowledge, communication, social incentives etc.), 'sticks' (rules) and 'carrots' (financial and economic incentives) (Bemelmans-Videc et al. 1998; Bergevoet et al. 2016). With a view to balancing the Directive's requirements with, e.g. the presence and mobilisation of political support, legitimacy, legal-institutional conditions and expected costs and benefits, Member States have employed elaborate **mixes of 'sermons', 'sticks' and 'carrots'** to implement the WFD.

Considering historical pollution loads and Dutch intensive land use, among others things, we acknowledge that not all problems relating to the implementation of the WFD in the Netherlands can be 'solved' by changing governance arrangements. Nevertheless, we believe that the particular organisation of the governance of water quality is an important factor determining the character and, ultimately, the effectiveness of specific policies and measures. From this point of view, it can be very helpful to look at other countries, to study how they dealt with problems relating to the substance and organisation of WFD implementation, and to see if lessons can be learned for improving the situation in the Netherlands.

When analysing or comparing the implementation of the WFD, as explained above, it is important to look at the **interrelation between the content (principles, goals, measures etc.) and the organisation**

of the governance arrangement. The flexibility and openness of the WFD's requirements may well lead to a process of selecting measures that are institutionally 'fit' and politically feasible, but fail to achieve the initial goals, exhibit low cost-effectiveness or violate the polluter pays principle. On the other hand, measures that may be supposed to be effective on paper but meet with – sometimes strong – resistance from stakeholders do not necessarily lead to satisfactory outcomes either.

In the project we will make use of the **Policy Arrangement Approach** (PAA; see Arts & Leroy 2006). A policy arrangement is defined as the temporary stabilisation of the content and organisation of a specific policy domain. A policy arrangement – or more broadly: governance arrangement – refers to a set of actors, rules, resources and discourses that has developed around a specific problem, in our case the chemical and ecological quality of water bodies. While actors, rules and resources define the organisation of the policy arrangement, discourses (dealing with principles, goals and means to achieve those goals) comprise its content.

Using the conceptual tools provided by the PAA, we distinguish three core dimensions to characterise governance and relate them to specific features of WFD policy implementation: multi-level, multi-actor and multi-sector governance.

Multi-level governance refers to the continuum of decentral versus central decision making from the local to the supranational and sometimes diagonally crossing relationships. The key question here is the relative influence of various levels of decision making on the implementation of the WFD. Is the process strongly centralized, are rules applied uniformly, or is it rather decentralized and possibly differentiated per region? How does this affect the setting of goals and ambitions and the selection of measures? It must be kept in mind, moreover, that multi-level governance is a dynamic phenomenon: ideas, measures and competences may be 'scaled up' or 'scaled down'.

Multi-actor governance focuses on participation and stakeholder management. Which governance actors (NGO's, farmers, water companies, authorities) are consulted at different levels of governance and who collaborates with whom? How and to what extent do different actors influence processes of goal setting, the selection of specific policies and measures and implementation?

The **multi-sector** dimension of governance, finally, entails the extent to which different sectoral policies are integrated and connected or rather differentiated and separated from each other. In the relation to the WFD, it involves the integration of water policy with other relevant policies such as agriculture, nature, industry and spatial planning.

An analysis of the substantial content of water quality arrangements in countries in relation to the three dimensions of governance (multi-level, multi-actor and multi-sector) forms the conceptual basis for formulating the following set of research questions.

2.2. Research questions

The central research question originally posed by the PBL was: ***How do modes of governance regarding the WFD differ in countries, and what are promising options or lessons for the Netherlands?***

This central research question can be divided into three core questions (CQs):

1. What are the most important **problems** regarding the WFD in the selected countries as well as in the Netherlands, how are they addressed in terms of **policies and measures**, and to what extent have these policies been successful?
2. What are the goals and measures of the **specifically selected policies** in the countries covered by this study and how are they organised? How do choices regarding **content and organisation** of policies and measures relate to their **success and failure**?
3. Which **lessons** can be learned from the selected countries for the implementation of the WFD in the Netherlands?

These three questions correspond with the three project phases described in the introduction. Answering CQ1 entailed acquiring a broad overview of WFD policies in the selected countries, i.e. Lower Saxony/Germany, Flanders/Belgium, Denmark, Austria and Ireland. On the basis of CQ1 a number of specific problems, policies and measures in the studied countries were selected. These formed the basis for a more detailed comparative analysis and subsequent lesson-drawing under CQ2 and CQ3. CQ2 aimed at better understanding the link between the *content* (or *substance*, especially goals, objectives and types of measures) and the *organisational characteristics* of the relevant governance arrangements in the selected countries. Under CQ3 it was attempted considered to draw practicable lessons from these insights for the Netherlands.

3. Research design and methods

In this section, we describe and justify the main methodological choices that were made in order to carry out the research project. One of the first crucial choices involved the selection of countries to be studied. After this selection had been made, we performed a quick scan and organised a first expert workshop to identify three specific issues to be studied in more detail in the main empirical phase of the project. In this phase, interviews were held with policy makers and stakeholders in all selected countries, leading to a number of potential lessons and warnings. Finally, by way of a second expert workshop, among other things, we assessed to what extent these lessons and warnings could actually apply to and be used in the Dutch situation.

3.1. Country selection

Following PBL's request, **Germany**, **Flanders/Belgium** and **Denmark** were included in the sample for the comparative study in view of their similarities with the Netherlands regarding water types, land use and problems. In addition, two countries that do not count among the 'usual suspects' are included. These are **Austria** and **Ireland**. As will be explained below, however, it was decided in a later stage not to include Austria in the detailed country studies of the second project phase.

Germany being a federal state with fairly divergent policies regarding water management across the 16 *Bundesländer*, we decided to focus on the state of Lower Saxony (while of course taking into account relations with relevant federal policies). Ecological circumstances and problem pressure in this *Land*, notably related to intensive livestock industry, come particularly close to the Netherlands. In the German system, the *Länder* have considerable freedom in setting their own policies with regard to water management. Generally speaking, multi-level coordination is a complex matter in Germany and voluntary cooperative arrangements play an important role in stakeholder involvement and sector integration.

Belgium is a federal state as well, with competences regarding water management strongly dispersed among different government levels (municipal, provincial, regional and federal). Here our focus will be on Flanders, first, because of the many similarities with the Netherlands in terms of ecology and problem pressure, and, second, in view of several interesting developments in relation to sector integration (including the *Coördinatiecommissie Integraal Waterbeleid* and regional initiatives) as well as regional differentiation of policies.

Denmark, in contrast with Germany and Belgium, is a unitary state in which, in practice, only two government levels are relevant for the implementation of the WFD: the central state and the approximately 100 municipalities. Similar to the Netherlands, intensive agriculture poses serious threats to water quality. In the 2000s, Denmark became known for its ambitions to integrate river basin management in the context of the WFD and the management of nature areas under the EU Birds and Habitats Directives. However, implementation of these ambitions turned out to be highly problematic.

Austria is a once again a federal state, but contrary to Germany and Belgium, more competences that are relevant for WFD implementation are concentrated at the federal level. Especially in Austria's lower parts, problems related to intensive agriculture and nutrients exist (European Commission

2017a). In an early stage, Austria committed itself to the principle of 'ecological integrity' (Chovanec et al. 2000). Despite its generally good performance with regard to the implementation of EU Water Directives, it did not yet submit information on the WFD's second cycle River Basin Management Plans (RBMPs) to the European Commission (European Commission 2017a).

Ireland, finally, has long lagged behind in terms of on the ground implementation of the WFD, but is now rapidly making up arrears. Ireland is a unitary state. With the second cycle of WFD implementation, moreover, it shifted from a system based on four domestic and three transboundary RBMPs to a single RBMP for the entire country. The occurrence of problems of mainly agricultural threats to water quality and the emergence of various new policy initiatives in this field (European Commission 2017b) make Ireland an interesting case for learning about policy innovation and new approaches to the implementation of the WFD.

3.2. Phase 1: Quick Scan and selection of specific policies and measures for further analysis

In the first project phase (October - November 2017), a **quick scan** was conducted to explore the current state of the WFD implementation in the selected Member States (CQ1). For this purpose, we identified the main problems, priorities, programmes of measures, best practices and 'worst' practices which could be of interest for further analysis.

The main documents that were studied included the most recent River Basin Management Plans (2015-2021) of the selected countries as well as additional documents from the respective national governments and the European Commission, for example national Nitrate Action Programmes and the 3rd and 4th Progress Implementation Reports from the European Commission. Moreover, relevant academic literature on WFD implementation was studied. In cases of doubt or missing information we consulted our network of national experts (see Annex 1).

This process resulted in a pre-selection – or **longlist** – describing in some detail the following problems and/or priorities (for a more elaborate description, see Wiering et al. 2017):

- Diffuse pollution, particularly nutrients, from agricultural sources;
- Hydro-morphological issues;
- Micro-pollutants, such as micro plastics, medicines and hormones;
- Governance arrangements, subdivided into arrangements mainly related to the coordination and cooperation between different levels of governance (multi-*level* governance), arrangements between different types of actors and stakeholders (multi-*actor* governance), and arrangements between water management and related sectoral policies such as spatial planning, nature or agriculture (multi-*sector* governance).

Crucially, the longlist did not only entail 'success stories'. It also included problems for which policies in other countries were just different from (but not necessarily 'better' than) those in the Netherlands and could therefore shed new light on the problem and the policy solutions at stake. Policy issues in this project may range, in other words, from 'best practices' and 'interesting practices' to 'worst practices'.

The longlist was presented to representatives of the Dutch water sector during a first **expert workshop** held in Utrecht on 21 November 2017 (for participants see Annex 2). It was discussed, among other things, if crucial problems – and especially those with potential relevance for the Netherlands – had been neglected. According to the experts, this was not the case. A major part of the workshop was then devoted to prioritising those problems that were deemed most relevant for the Dutch context (for further details, see Wiering et al. 2017)

On the basis of the outcomes of the quick scan and the workshop three themes were eventually selected for further analysis during the second project phase:

1. **Multi-sector cooperative arrangements** and water quality management;
2. The **multi-level regionalisation and differentiation of policies** regarding water quality management;
3. The **mix of instruments** focusing on **nutrients** (diffuse agricultural pollution).

As described in the Project Proposal and the Interim Report, it was our original intention to limit the analysis for each theme to those countries that could be considered most interesting with regard to the problem at stake. In the process of selecting the themes, however, it became more and more clear that this criterion was very difficult to work with. Interesting dilemmas and potential lessons with regard to (1) multi-sector governance, (2) multi-level governance and (3) the mix of instruments can in fact be observed in every country. Moreover, they tend to be strongly related. Questions of policy instrumentation, for instance, are often linked to questions of the multi-level division of competences or the multi-sector involvement of various stakeholder. Even though these questions can to some extent be analytically separated, as we will actually try to do in chapter 4, it makes sense to study them in close connection to each other. Therefore – and combined with considerations of time and budget – it was decided to **exclude Austria** from the second project phase and, instead, to **study the three above-mentioned themes and measures in all remaining counties, i.e. Denmark, Germany (Lower Saxony), Belgium (Flanders) and Ireland**.

We will now briefly elaborate on the selected themes. As will be explained below (section 3.3) a further specification of the themes was made during the empirical phase of the project.

1) Multi-sector cooperative arrangements and water quality management
The multi-sector dimension of governance entails the extent to which different sectoral policies are integrated and connected or rather differentiated and separated from each other. In relation to the WFD, it involves the integration of water policy with other relevant policies such as agriculture, nature, industry and spatial planning. The countries in our sample have developed a variety of **cooperative arrangements** to deal with the problem with the problem of multi-sector governance, ranging from integrated policy programmes to coordination bodies, both at national and regional level.

For the analysis relating to this theme the following question was leading: *What can we learn from other countries regarding the national and regional coordination of different policy interests related to water quality management?*

2) Multi-level regionalisation and differentiation of policies regarding water quality management
Multi-level governance refers to the continuum of decentral versus central decision making, from the local to the supranational and sometimes diagonally crossing relationships. A key question here is the relative influence of various levels of decision making on the implementation of the WFD. Following the implementation of the WFD, institutional structures have changed in several European countries. With regard to the WFD, some countries have experienced a process of **centralisation**, while other countries have faced decentralisation or **regionalisation**. A related question is that of regional **differentiation**: to what extent and how can policies in the field of water quality management be regionally differentiated, for instance in view of differences in problem pressure or geographical characteristics?

For the analysis relating to this theme the following question was leading: *What could we learn from other countries regarding the distribution of responsibilities between the national and regional or local level as well as the regional differentiation of WFD policies?*

3) The mix of instruments focusing on nutrients (diffuse agricultural pollution)
The third theme revolves around the **policy instruments** and the **mix** of those instruments that are applied when dealing with diffuse pollution by agriculture and more specifically with phosphates and nitrates from agricultural sources, from now on labeled as the **nutrients problem**. This problem is generally recognized as one of the major challenges of the WFD in all countries in our sample, which all exhibit intensive agriculture land use combined intensive livestock farming (Van Gaalen et al. 2015; Van Grinsven et al. 2016).

Measures addressing the nutrients problem can be either source-oriented or effect-oriented. Source-oriented measures, e.g. reducing the amount of manure applied to the soil through stricter emission standards, have proven to be effective (Van Grinsven et al. 2016) in improving the water quality, but are politically and economically problematic as they would imply costly measures for manure processing at the farm and possibly affect crop production as well as conditions of competition on the market. They would therefore need political support from a wide variety of actors, including farmers, agro-business and consumers. Effect-oriented measures, such as investing in technologies or management measures to reduce nutrient levels in the environment, e.g. removing nutrients from the soil or adapting flows of polluted and less polluted water, are politically more feasible but tend to transfer costs to the water quality manager and finally to the general public, which is not in accordance with the polluter pays principle (art. 9, WFD).

Furthermore, as mentioned earlier, a distinction is commonly made between '**sermons**' (knowledge, communication, social incentives etc.), '**sticks**' (rules) and '**carrots**' (financial and economic incentives) (Bemelmans-Videc et al. 1998; Bergevoet et al. 2016). The quick scan revealed the use of several types of programmes and measures:

i. Rural development projects (mostly carrots)
ii. Nutrients policies, especially manure legislation and Nitrate Action Programme (mostly sticks)
iii. Organisation of changing agricultural practices (sermons and carrots)

For the analysis relating to this theme the following question was leading: *What can we learn from other countries regarding the selection and functioning of the mix of policy instruments applied to the nutrients problem in relation to water quality management?*

3.3. Phase 2: In-depth analysis of specific policies and measure in the selected countries

In the second and largest project phase (November 2017 - March 2018) the **in-depth analysis** of policies and measures under the three themes was carried out. This entailed empirical investigations in all remaining countries, i.e. Denmark, Germany (Lower Saxony), Belgium (Flanders) and Ireland, mainly through the study of primary and secondary literature (policy documents, 'grey literature' such as research reports, academic literature) and interviews with key policy makers. The use of different types of sources made it possible to triangulate our findings.

For the study of **primary and secondary literature** the material collected for the quick scan was taken as a starting point. With a view to the three themes described above, more specific literature was searched. In many cases, interviewees referred us to additional, often 'grey' literature, such as policy reports or evaluations carried out by government agencies or national research institutes.

Interviews with policy makers and stakeholders were held in all four countries in February and March 2018. Four to seven interviewees per country were selected on the basis of (a) recommendations by our national experts (see Annex 1), (b) our own study of national policy documents and (c) targeted searches via the Internet. For all countries, the interviews covered in any case the responsible ministry or ministries (e.g. Environment, Agriculture, Food), the relevant executive branch or branches of these ministries, the main farmers' organisation as well as the environmental/nature organisation most involved in the issue. Dependent on the specific organisation of water policy, WFD implementation and nutrients policy in the country at stake, also other actors could be included. A full list of respondents can be found in Annex 3.

All interviews were conducted in person by two team members and recorded. Drafts of the empirical country sections (see sections 4.1-3) were sent to the respective respondents for comments and approval. Due to the controversiality particularly of the nutrients problem in some of the sample countries, several respondents were prepared to participate only under the condition of **confidentiality**. For this reason, interviews are referred to in chapter 4 only in general terms.

3.4. Phase 3: Lesson-drawing for the Netherlands

In the third and final project phase, it was assessed to what extent the findings of the in-depth country studies (see section 4.4 for a summary of the key findings) could serve as **lessons** for the Netherlands (see chapter 5). We critically assessed our findings against primary and secondary literature regarding process and problems of WFD implementation in the Netherlands. Perhaps even more importantly, we discussed and evaluated our findings with a panel of Dutch and foreign experts during a one-day **workshop** in Nijmegen on 12 April 2018 (for participants see Annex 4). The workshop provided important input for assessing the practical complications and potential added value of applying foreign lessons to the Netherlands. Following the workshop, a draft of chapter 5 'Conclusions: lessons and warnings for the Netherlands' was prepared. Two Dutch participants of the workshop (see Annex 4) were so kind to provide critical and detailed feedback on this draft.

4. Findings: Lessons and warnings

This chapter will present the findings collected in Denmark, Lower Saxony, Flanders and Ireland in phase 2 of the project. As described in the previous chapter, these findings are based on a combination of literature study and interviews with key policy makers and stakeholders in the countries involved. For each theme – i.e. (1) multi-sector cooperative arrangements, (2) regionalisation and differentiation, and (3) the mix of instruments – we start with a relatively **detailed descriptions** of the relevant policies in each of the four countries, followed by a comparative analysis (sections 4.1-3). The chapter concludes with a **summary of the key findings** (section 4.4). In the next chapter, the relevance of these 'lessons and warnings' for the Dutch context will be assessed.

4.1. Multi-sector cooperative arrangements

In many countries, we see trends towards the **involvement of stakeholders from multiple sectors**, at the national but particularly also at the regional and local level. The trend to involve more non-governmental stakeholders also reflects the demand for increased public participation stated in Article 14 of the Water Framework Directive.

4.1.1. Multi-sector cooperative arrangements – Denmark

Since 2007, the regional level has been virtually absent in the Danish WFD process. In that year, a general government reform led to the abolishment of the county level. This left Denmark with only two administrative levels. As far as water management is involved, the Ministry of Environment and Food holds responsibility for general policy formulation as well as the establishment of RBMPs, whereas most of the relevant operational competences are allocated to the approximately 100 municipalities. Against that background, the 2013 Water Planning Act laid the legal foundations for establishing **23 regional Water Councils**. The Water Councils bring together a wide variety of stakeholders and are linked to Denmark's 23 sub-catchment areas. The Water Councils are not a replacement of the former county level nor a full-fledged institutional structure at (sub-)river basin level, comparable to for instance the Dutch Water Boards (Interviews Denmark February 2018). They are in fact **temporary structures dealing with relatively narrowly defined assignments**. Nevertheless, the two cycles of Water Councils that have been carried through so far may provide some interesting lessons.

Each Water Council consists of around 20 members representing a **wide range of interests**, among others agriculture, agribusiness, drinking water companies, nature organisations, recreation and anglers' associations (see Graversgaard et al. 2017). Organisations can apply for membership. One municipality that is represented in the Council serves as '**secretariat municipality**'. It has the final say over the appointment of members to the Council and in doing so tries to achieve a balance between users and protectors of the water. In addition, being knowledgeable and having the administrative capacity, it serves as facilitator and performs various secretarial tasks (Graversgaard et al. 2016, 2017). The Water Councils are set up for a period of 1-2 years in which they deal with a specific task assigned by the Ministry. They don't have any formal legal or budgetary powers. At the end of the period, the Councils are dissolved and a new cycle begins.

The Danish Water Councils were, to some extent, modelled after a Swedish example, also known as water councils or water boards, which have existed since the mid-2000s (Interviews Denmark February

2018). The Swedish councils, however, have a strongly bottom-up character. Lacking a pre-assigned task, moreover, they are mainly engaged in a more general process of exchanging and disseminating information (Graversgaard et al. 2017; Thorsøe, Dalgaard & Graversgaard 2017; see also Franzén et al. 2015).

In the **first cycle** (2014-15), the Water Councils were given the task to select an optimal and cost-effective mix from a 'catalogue' of 16 measures and within a pre-given budget (a total of 93 million Euros for the entire country) for the restoration of streams in their respective sub-catchments. As a back-up, the possibility of obligatory measures was available, but in fact the Water Councils were reported to be highly **successful**. Most of the 23 Councils came up with proposals that would lead to a considerably higher length of streams being restored for the same budget than the measures initially proposed by the Ministry's Nature Agency. Key factors mentioned in the literature and during interviews were the effective use of **local knowledge** and the building of **trust and commitment** among stakeholders (Graversgaard et al. 2017; Interviews Denmark February 2018). Most of the Councils' recommendations in the first cycle were taken seriously by the municipalities that were, in this case, responsible for implementing the selected measures (Graversgaard et al. 2017; Interviews Denmark February 2018).

In the **second cycle** (2016-17), the task was to evaluate and possibly revise the designation of waters under the WFD as 'natural', respectively 'heavily modified'. Denmark initially designated a relatively high share of its waters as 'natural', which implies stricter requirements under the WFD (Liefferink et al. 2011). The success of this cycle of the Water Councils was broadly perceived as very **limited**. Reasons given for this included the **highly technical character** of the assignment and, more importantly, the fact that there was **no budget** – i.e. no 'carrot' – to be divided in the process. The latter factor led in many Councils to a zero-sum game in which agricultural interests (generally in favour of designation as 'heavily modified) and nature interest (generally in favour of designation as 'natural') found themselves in diametrically opposed positions without being able to strike a compromise (Jørgensen 2018; Interviews Denmark February 2018). That most Councils managed to produce a result at all was connected by some respondents to the trust and the constructive attitude that had been built up during the first cycle. The problems were acknowledged by the Minister of Environment and Food and will be taken into account when preparing the third cycle of the Water Councils (Jørgensen 2018).

The experience of the two cycles of Danish Water Councils suggests that, even in a highly controversial and politicised area, regional multi-sector cooperative arrangements can be effective for tapping local knowledge and building support, commitment and trust among local stakeholders when at least two conditions are met. First, there has to be a **clearly circumscribed and 'constructive' task** and, second, there has to be **'something to gain' for all parties** involved. In that case, the impact can actually go beyond the specific task at hand and contribute to building trust and good working relations among stakeholders on a longer term.

4.1.2. Multi-sector cooperative arrangements – Lower Saxony

In Lower Saxony, the state Ministry of the Environment is responsible for implementing the Water Framework Directive. It delegates technical and operational work primarily to the environmental state agency (*Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz,* NLWKN). For

a comprehensive overview of other actors involved see Kastens and Newig (2007). The planning process is organised relatively centrally, whereas the operative enforcement of measures is organised mainly decentrally (Newig et al. 2016). Therefore, a number of regional cooperative arrangements were established to manage water quality. These include, in chronological order, (1) 'drinking water protection cooperations' (*Trinkwasserschutzkooperationen*), (2) 'area cooperations' (*Gebietskooperationen*) and (3) 'water alliances' (*Gewässerallianzen*) including the role of 'care-takers' (*Kümmerer*).

Drinking water protection cooperations ('Trinkwasserschutzkooperationen')
Lower Saxony distinguishes drinking water protection areas, which have a standard for nitrate concentration in the groundwater of 50 mg/l (NLWKN 2015). In 2012, Lower Saxony had 376 drinking water protection areas, 12% of the agricultural area of Lower Saxony is situated in these areas and most of these agricultural areas are part of a drinking water protection cooperation. In 2012, Lower Saxony counted around 74 drinking water cooperations (Interviews Lower Saxony February/March 2018).

The drinking water protection cooperations were set up in 1992 when the Lower Saxon Water Law was updated introducing a **water extraction fee**, which is paid by water users (for example, public water supply is €0.075/m^3). The ministry agreed to use the taxes for financing the protection of drinking water resources, i.e. implementing measures to reduce the diffuse nutrient inflow. It is legally regulated that at least 50% of the tax revenue has to be invested in drinking water protection (Interviews Lower Saxony February/March 2018). Per year, Lower Saxony invests around €18 million in these drinking water cooperations. It is invested in (1) **intensive groundwater-oriented consultation of single farms** (€6 million) and (2) **financing voluntary measures for the protection of the groundwater** (€12 million). However, the financial budget is actually a limiting factor as more cooperations could be set up with more budget (Interviews Lower Saxony February/March 2018).

A **catalogue of measures** describes various options, but they offer some freedom and can be implemented according to the **local conditions** (NLWKN 2015), which increased the acceptance of these measures. When developing the catalogue of measures, governmental officials aimed to have measures that are useful from a water quality perspective, but also from the economic perspective of the farmer (Interviews Lower Saxony February/March 2018). These measures include for example: reduction of fertilisation or pesticide use, the transformation of agricultural areas in grassland (NLWKN 2015). These measures may lead to reduced yields, in which case farmers are compensated for their loss in profit (Interviews Lower Saxony February/March 2018; NLWKN 2015). A precondition for farmers' participating in the drinking water cooperation is the disclosure of their purchase and use of fertilisers, which goes beyond the stipulations of the Fertiliser Ordinance and gives much more concrete insights while leaving less room for valuations (Interviews Lower Saxony February/March 2018).

The idea is that the water supplier and the farmer are **equal partners**. To receive the money they have to develop a protection plan (*Schutzkonzept*), where they agree on goals and success standards. With this plan, water suppliers apply for financing (min. €50,000) with the NLWKN, who also coordinates these cooperations (NLWKN 2015). A list of priority areas is annually developed. These areas are eligible for different amounts of subsidies (high priority means higher subsidy rate) (NLWKN 2015, p.

4). The prioritisation is mainly based on the nitrate concentration of groundwater (ibid). In all areas the measures are accompanied by monitoring, e.g. measuring the residual N-concentration in the soil (Interviews Lower Saxony February/March 2018; NLWKN 2015).

In general, drinking water cooperation are seen as a **success** by most interviewees (Interviews Lower Saxony February/March 2018). It appears that they are a quite effective way to improve the groundwater quality as excess N-concentration as well as the purchase of mineral fertiliser decreased (Interviews Lower Saxony February/March 2018; NLWKN 2015). From the 1990s to 2005 water quality improved (NLWKN 2015). The consultation was seen by interviewees as very important for creating acceptance among farmers as it helps them to see that they do have an advantage from the measures, for example in terms of saving costs for fertilisers. Moreover, the good experiences of the drinking water areas also affect other areas, e.g. farmers showed more inclination to use catch crops also beyond these areas. However, from 2008 onwards the positive trend stagnated and in some areas water quality deteriorated again. One of the main drivers for this change was the Federal Renewable Energy Law, which triggered the construction of biogas plants in the intensive life-stock farming areas of Lower Saxony. This development had negative consequences for water quality. An additional driving force was that farmers feared that they would not be able to extend their farms in the future due to upcoming regulations. In anticipation, investments in farm extensions increased, supported by the food producing industry (Interviews Lower Saxony February/March 2018).

Area cooperations ('Gebietskooperationen')

In 2005, 30 area cooperations were established on the level of sub-basins (Newig et al. 2016). Their aim was to facilitate regional dialogue and information exchange between governmental officials, water management authorities and interest groups across multiple sectors and governmental levels. The purpose was to (1) **develop measures implementing the WFD** and to make proposals for monitoring approaches (Ridder et al. 2007). The plans and ideas should emerge bottom-up from the region (Interviews Lower Saxony February/March 2018) to allow a **flexible reaction to local conditions** (Newig et al. 2016). The area cooperations are also involved in the prioritisation of waters (*Schwerpunktgebiete*, see below), as well as the development and planning of measures. (2) The cooperations also facilitate the **dialogue between regional and *Länder* level** to discuss successes and difficulties and comment on and deliver input for the river basin management plans. For the first river basin management plans, it was a very elaborate approach with a lot of meetings. For the phase of the second plan, the frequency of meetings was lowered. It is perceived as important to keep the area cooperations as public participation venues in place and not lose connection to the region as otherwise one would need to start from scratch again for the next round of RBMPs (Interviews Lower Saxony February/March 2018).

The cooperations consist of **permanent participants** present in all cooperations, e.g. NLWKN (environmental ministry's implementing agency), municipalities, local maintenance and fresh water associations (see below), water suppliers, environmental organisations and industrial representatives. In addition, there may be **non-permanent participants** that are only invited in particular areas, e.g. the dike organisation in coastal areas (Interviews Lower Saxony February/March 2018). The NLWKN gathered these groups together to discuss freely. The NLWKN is in most cooperations responsible for the executive office (*Geschäftsführung*), whereas one of the other partners takes over the management (*Geschäftsleitung*). Notably, the area cooperations did not receive a formal decision-

making competence. The annual budget for each cooperation was limited to €15,000 (Newig et al. 2016), which could be invested rather freely for measures to support public relations (Interviews Lower Saxony February/March 2018). Koontz and Newig (2014, p. 431) illustrate the approach with a quote: "NLWKN has money to give to local requestors. They have to propose a project with a responsible party, willing landowner, and financing of the 10 percent local match (NLWKN provides 90 percent of the funding). When we get proposals, we see if the project fits our identified priorities, and if it does then we give the money." Most of the projects focus on hydromorphological improvements, chemical water quality is often only a by-product (Koontz & Newig 2014). In 2009/2010 it was decided to finance the implementation of measures through the major subsidy programmes. The money directly and freely available to the cooperation was decreased to €1,500 annually to cover costs for public engagement (Interviews Lower Saxony February/March 2018).

The evaluation of the area cooperations appears to vary. Representatives of the ministry still see the area cooperation as an important input and **sounding board** for developing the river basin management plans and organising public participation (Interviews Lower Saxony February/March 2018). Representatives of local participants stress that in some areas the participatory process of working together in a group had a positive influence on **raising awareness** for the water quality issue and implementing measures, as well as **creating a regional network** where people get to know each other (Interviews Lower Saxony February/March 2018; Koontz & Newig 2014). According to a survey among participants of area cooperations, they perceived the area cooperations generally as a positive development (Ridder et al. 2007). However, ten years after this survey the enthusiasm appeared to have ebbed down in some areas. The effectiveness concerning the development and implementation of measures to improve water quality is varying. In some area, the communication between the different stakeholders works well and is perceived as fruitful to develop plans (Koontz & Newig 2014). However, in other areas the output is lower and is not perceived as valuable in developing plans (Interviews Lower Saxony February/March 2018). One interviewee directly involved in the process summarized it as follows: "We had good discussions with all stakeholders around a table and developed nice plans, however, the implementation was missing." (Interviews Lower Saxony February/March 2018). Difficulties were encountered when applying for financial funds, which are very bureaucratic leaving little room for synergies. For some municipalities and maintenance boards financing 10% of the costs of measures turned out to be problematic. Nature organisations, for example, are often not eligible to carry measures. And finding agreement to get the necessary land sometimes proved to be a limiting factor. Additionally, interviewees representing local stakeholders perceived the area cooperations, after all, relatively top-down (Interviews Lower Saxony February/March 2018). Furthermore, in some but not all areas, the discussions in the area cooperations were dominated by the agricultural sector's interest (Interviews Lower Saxony February/March 2018; Newig et al. 2016).

Water alliances and care-takers ('Kümmerer')

One major problem in Lower Saxony is the lack of progress and success, which impacts on reports to the EU and makes it harder to motivate stakeholders to actively participate and take action (Interviews Lower Saxony February/March 2018). In order to demonstrate successes so-called '**focus water bodies'** (*Schwerpunktgewässer*), i.e. waters with a high potential for improvement, were identified. These waters were selected based on following criteria: (1) they are assessed with a moderate status or potential and are only one degree away from a good status or potential, and (2) they show promising

biological repopulation potential according to a biological assessment. The focus areas cover approximately 60.000 – 100.000 ha (Interviews Lower Saxony February/March 2018; NLWKN 2018).

In 2015, water alliances were set up to develop and implement targeted measures for these focus water bodies. The water alliances take the form of **cooperation agreements** between the NLWKN and local maintenance boards (*Unterhaltungsverbände)*, i.e. the local associations responsible for the maintenance of 2nd and 3rd order water bodies. In comparison to the Dutch regional Water Authorities, maintenance boards are small and local structures. In the whole area of Lower Saxony there are 107 such boards, working together in the Association of Water Authorities (*Wasserverbandstag*, WVT). The maintenance boards are perceived to be close to the citizen, which is seen as positive as it enables the development and organisation of area-specific approaches in cooperation with local stakeholders (Interviews Lower Saxony February/March 2018).

For many local actors, including maintenance board but also municipalities, the implementation of the WFD is perceived as an additional task, not least due to the extensive reporting duties. The cooperative approach of the water alliances is supposed to bridge this divide. The water alliances are, in contrast to the area cooperations, a **voluntary offer** to the maintenance boards and stakeholders. The NLWKN identified the focus water bodies and developed a number of management measures. If a maintenance board decides to cooperate with the NLWKN in these areas, it may choose from these measures and can develop them further to fit the area-specific context (Interviews Lower Saxony February/March 2018).

For the actual planning and implementation a, so-called, **care-taker** (*Kümmerer)* is installed, i.e. someone from the local maintenance board, whose main task is to work on the implementation of the WFD. In other words, someone who takes the lead and the responsibility, as one interviewee summarized it: “It needs someone to care” (Interviews Lower Saxony February/March 2018). This care-taker is partly financed by the ministry, i.e. by 80%. At the moment of writing, there are 11 care-takers and most of them are engineers. The new minister already confirmed the financing for these water alliances for the coming period and the aim is to increase the number to 24 in the future (Interviews Lower Saxony February/March 2018). The idea is that the care-taker ‘canvasses from door to door’ talking to farmers, to the local authorities and to relevant interests groups. One of the biggest issues is lack of land as many different developments increase the land demand, which causes prices to explode (Interviews Lower Saxony February/March 2018). A care-taker may be a possibility to find locally innovative solutions for this problem, for example by finding agreements for land purchase, land swap or land consolidation. Interviewees say that it is necessary for a care-taker ‘to have a face’ and to be able to establish a network, so that at one point s/he knows the people and whom to talk to. This makes it possible to combine different interests and identify synergies, for example, with tourism, biodiversity or flood risk management. The task of the care-taker is also to make better use of the existing funds to develop projects and to apply to them. Notably, focusing water bodies will receive preferred funding (Interviews Lower Saxony February/March 2018).

Water alliances in focus water bodies are generally seen as a positive development as public resources are limited. It is necessary to show ‘lighthouse examples’ and to focus on success (Interviews Lower Saxony February/March 2018). However, the implication may be that other areas with potentially motivated stakeholders have a disadvantage by not being supported in a similar way.

4.1.3. Multi-sector cooperative arrangements – Flanders

For decades integrated water policy has played a central role in the Flemish water management (Crabbé 2008). The Decree on Integrated Water Policy of 2003 provides the legal framework for integrated water policy, contains provisions to regulate both water quantity and quality issues, and defines the classification of water systems into 2 river basins districts, 11 sub-river basins, 103 sub-sub-river basins, 6 groundwater systems and 42 groundwater bodies. Furthermore, the Coordination Committee of Integrated Water Policy (*Coördinatiecommissie Integraal Waterbeleid*, CIW) was established, which is responsible for the two river basin districts that exist within its territory (Van Kempen & Uitenboogaart 2009; Mees et al. 2017). With the 2013 reform of the Decree on Integrated Water Policy, the 103 sub-sub-river basins were abolished, together with the 52 district water boards (*waterschappen*) to which one or multiple sub-sub-river basins belonged (Interviews Flanders February/March 2018). These reforms were implemented to simplify the organisation of Flemish water policy, i.e. to reduce the plan load and the fragmented organisation of water governance with multiple governmental institutions from different government levels all having planning responsibility (Carette & De Smedt 2013; CIW 2013). Two cooperative arrangements will be discussed in more detail in this section: the CIW at the Flemish level and integratedwater projects at the local level.

Coordination Committee of Integrated Water Policy

At Flemish level, the **multi-disciplinary committee** CIW, chaired by the Flanders Environment Agency (*Vlaamse Milieumaatschappij*, VMM), holds responsibility for the preparation, planning, supervision and follow-up of integrated water management and is responsible for the implementation of the decisions on integrated water policy of the Flemish government. Most of the relevant operational competences are allocated to some of the CIW's members, that is on Flemish level to policy domains of respectively Environment and Spatial Planning; Mobility and Public Works; and Agriculture and Fisheries; and on the regional and local level to the provinces, cities and municipalities, as well as the polders and drainage authorities[1]. Other members are representatives from the Department of Economy, Science and Innovation and the umbrella organisation of water companies (CIW 2018; Interviews Flanders February/March 2018). It is generally appreciated that officials from different administrative entities all focus on the water theme from a sustainability perspective: how to improve water quality and water quantity in Flanders. With the establishment of CIW – a multi-level and multi-sector administrative platform – the **coordination of water policy** was significantly improved. As CIW is an administrative entity, there is still progress to be made on increasing the involvement of non-administrative entities like environmental and farmer organisations. Recent developments can offer a solution like more participative preliminary consultations between administrative and non-administrative institutions (Interviews Flanders February/March 2018).

Sub-river basins and prioritised areas

Each sub-river basin has a common organisational and consultative structure: the sub-basin management coordinates water policies within its territory and approves the sub-basin management plan (political consultation between the Flemish region, the provinces and the municipalities), the basin council advises the management on such plans (social consultation with civil society actors representing different sectors) and the basin secretary is in charge of the daily management of the sub-basin organisation. The secretariat is composed of a sub-basin coordinator and one or more

[1] The regional and local water managers are represented by their umbrella organisation.

planners (all public officials from the Departments of Environment and Mobility and Public Works and from the provinces) who are responsible, amongst others, for the preparation of the sub-basin management plans and the investigation of bottlenecks in the sub-river basins (Mees et al. 2017).

The bottlenecks that gain particular attention are those situated in the **prioritised areas**, which are groundwater bodies and relatively small river basins that are one degree away from a good status. In the second Flemish RBMPs (2016-2021) specific action and focal areas are designated for groundwater bodies with insufficient quantitative status to achieve good status under the WFD by 2021. For surface water respectively 17 areas with label *'speerpuntgebied'* and 56 areas with category *'aandachtsgebied'* have been prioritised. The goal is to reach the good status under the WFD in 2021 within the *speerpuntgebieden* and in 2027 within the *aandachtsgebieden*. In other words, there is **temporal differentiation** based on promising potential for improvement (CIW 2015a, 2015b; Interviews Flanders February/March 2018). The decision to focus on the prioritised areas is widely supported by the Flemish water managers (Interviews Flanders February/March 2018). Not only is it a more cost-effective way of dealing with water quality problems, stakeholders are also mobilised more easily to actively participate and to take action together. Furthermore, it enhances the possibilities for Flanders to reach the good status in a number of water bodies by 2021 or 2027. Flanders could then report some positive figures, i.e. progress, to the European Commission. To reach the good status in time focused efforts – **integrated water projects** – are necessary.

Integrated water projects

On a more local level a wide variety of stakeholders are brought together in the so-called integrated water projects (*integrale waterprojecten*). Integrated water projects are linked to the 11 sub-river basins as they are mostly initiated by the sub-basin secretariats. An integrated water project is a **temporary structure** to deal with problems of local water systems. It is a territorial approach to address local problems of e.g. diffuse pollution, water quality, water quantity, sediment, ground water and fish migration. It consist of a three-step approach – **assessment, participation and implementation** – to exchange information and local knowledge and facilitate dialogue between (amongst others) Flemish departments, provinces, municipalities, drinking water companies, sewer managers, recreational organisations, national and local nature protection organisations, local farmers, and local and national farmer organisations (Guelinckx 2016; Interviews Flanders February/March 2018). First, the prioritised areas are subjected to a thorough screening which is coordinated by the sub-river basin secretariat: what are the problematic parameters, the bottlenecks and opportunities. Second, these findings are shared and discussed with governmental officials, water management authorities and interest groups. Multi-stakeholder deliberation is conducted to further investigate bottlenecks and opportunities, to come up with tailor-made solutions taking into account the area-specific characteristics, to generate local support and to coordinate efforts. The final step is to implement measures – it is then clear who does what, how, where and when – evaluate and, if necessary, implement additional measures.

The participatory approach should lead to commitment from the involved parties as their participation is voluntary in this local cooperative arrangement. The sub-basin coordinator (and the sub-basin secretariat in general) tries to enthuse both governmental actors and different interest groups to get involved; this effort is highly valued by interviewees (Interviews Flanders February/March 2018). Interest organisations mainly participate because of knowledge exchange and information provision, while predominantly municipalities, provinces and Flemish government take responsibility for the

implementation of the tailor-made solutions, sometimes on a voluntary basis. Some of these measures are part of their legal tasks, others are not and not all (especially local measures) are mentioned in the Programme of Measures of the second Flemish RBMPs and the accompanying budget allocation (Interviews Flanders February/March 2018). However, administrative officials feel committed to act as the sub-basin coordinator has no own resources to offer other than its enthusiasm. To speed up the process, the sub-basin coordinator approaches his/her network to search for possibilities for synergies/win-wins with other participants or planned activities. In the search for additional budget for implementation, 'creative' sub-river basin coordinators apply for European and national funds. The implementation speed of measures could still be higher as the sub-river basin secretariat cannot strongly enforce the implementation process. Nevertheless, in general the sub-river basin is assessed as a valuable way for (sufficient) attention to local ecology and the territorial approach (*gebiedsgerichte werking*) (Interviews Flanders February/March 2018).

4.1.4. Multi-sector cooperative arrangements – Ireland

At the start of the implementation process of the WFD in Ireland, a division of the territory into **relatively small river basin districts** was chosen, with four in the Republic of Ireland and three cross border basins with Northern Ireland (as well as one situated fully in Northern Ireland). In addition, local authorities and the national Environmental Protection Agency (EPA) were identified as the principal competent authorities responsible for implementing the Directive in Ireland (Environmental Protection Agency 2008). The EPA was mostly investing in data collection and preparing the (many) plans and programmes of measures for the river basin districts, while the local authorities had to implement them. These authorities are the historical counties (26) – some going back to the Norman invasion – the city councils (3) or combined county and city councils (2). In practice, it could be maintained that, despite these river basins districts being in place, the policies were actually made at the (renamed) Ministry of Housing, Planning, Community and Local Government together with the EPA. Local Authorities (counties and city councils) suffered from a lack of specific structures and resources to make sure that this would lead to implementation results. Some progress was made, but predominantly related to older regulation, such as the Nitrates Directive and the Urban Waste Water Directive (Environmental Protection Agency 2015, 2016; Daly et al. 2016).

These initial structures were generally evaluated as insufficient and inefficient, therefore, the Ministry and EPA **changed the approach quite radically** in the second round of the RBMP cycle (2016-2021) (Department of Housing, Planning, Community and Local Government 2017). The official districts in Ireland were merged to form **one national River Basin District**. The responsible authorities set up a three-tier approach, with the **first tier** being the new Water Policy Advisory Committee, which is a relatively multi-sector and independent national level forum. The **second tier** is then the EPA itself (policies, data collection and monitoring) and an important new **third tier** is at the level of local authorities, where the new Local Authorities and Communities Office (LAWCO) will support local authorities and communities, in part through five regional committees (LAWCO 2017)(see Figure 4.1). It is supposed to bring together the relevant officers of municipalities and counties, as well as relevant stakeholders, to jointly discuss and implement the necessary programmes of measures and work on characterisations, public consultation and awareness of water issues.

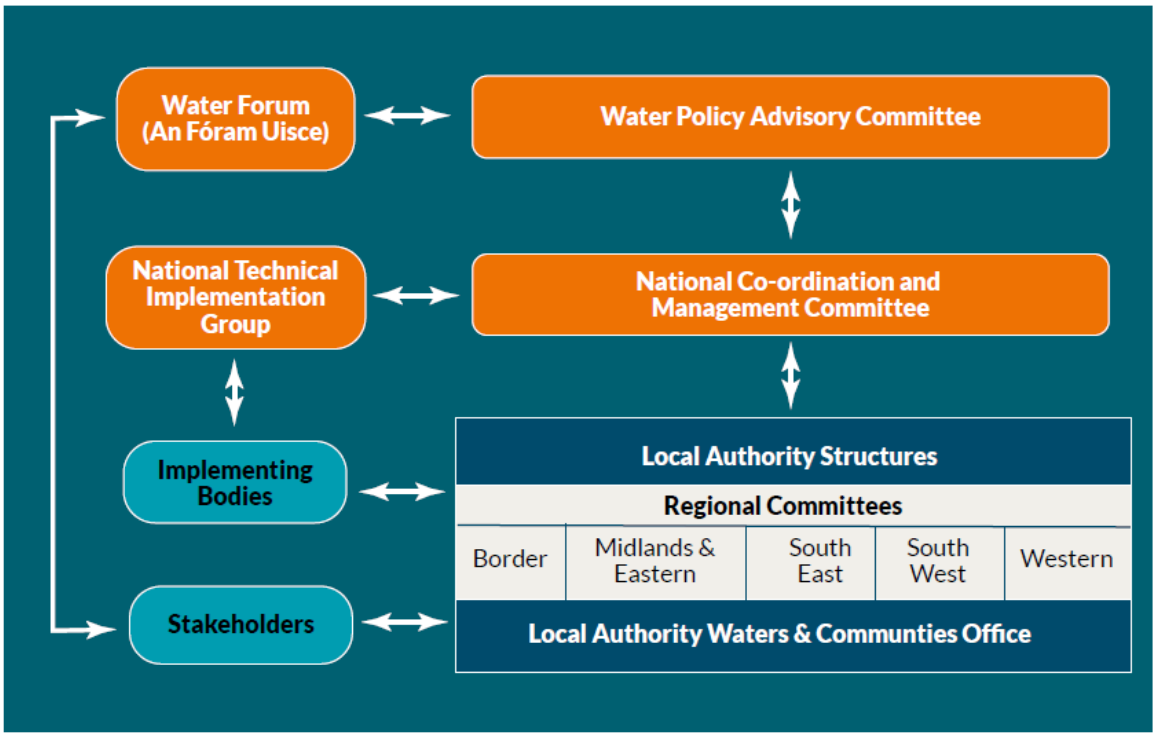

Figure 4.1 The coordination structure of the implementation of the WFD after the second round of RBMP
Source: Department of Housing, Planning and Local Government 2018, p. 119.

In light of multi-sector cooperative arrangements two levels are particularly interesting, the national and local authorities. On a national level, the **Water Policy Advisory Committee** was established (under S.I. No. 350 of 2014) to support and advise the Minister on the development of the RBMP. It is described as a **high-level policy committee**, which meets on a quarterly basis and brings together the **key national organisations**. It is chaired by a representative of the Minister for Housing, Planning and Local Government; further involved are the EPA, the Department of Agriculture, Food and the Marine (DAFM) as well as an array of other departments, the Commission for Regulation of Utilities, the Local authorities, Irish Water, Inland Fisheries Ireland, Office of Public Works and the Geological Survey of Ireland. The Water Policy Advisory Committee is further supported by the members of the POMs Steering Group, which oversee development of the POMs and of the draft and final Plan (LAWCO 2017; Interviews Ireland March 2018; Department of Housing, Planning and Local Government 2018).

The **Water Forum** was established only recently under the 2017 Water Services Act. It should function as an independent entity that "has discretion to determine its own work programme and the means of communicating its views and analysis. Its functions include advice on the WFD and inland aquatic environment and water resources especially for the Water Policy Advisory Committee" (see Figure 4.1). In order to advise the Minister, it may carry out research independently (Department of Housing, Planning and Local Government 2018, p. 119). The Forum is a **broad, multi-sector 'sounding board'** that more or less tries to bridge state and civil society. There are currently 26 members on the Forum: "consumer groups; Irish Water consumers; community groups; rivers trusts; groups that participate in aquatic activities, such as fishing and water sports; sectors with a particular interest in water issues, such as the agricultural and business sectors; the community and voluntary sector; the environmental sector and organisations representing rural Ireland and the group water scheme sector. The Forum

provides an interface between science, citizen/ stakeholder engagement and water policy." (Department of Housing, Planning and Local Government 2018, p. 120; National Water Forum 2018). The layer of the five regional committees, with support from the Local Authorities and Communities Office (LAWCO) will actually be the most important regional multi-sector cooperative arrangement in Ireland. It is supposed to bring together the relevant officers of municipalities and counties, as well as relevant stakeholders, to jointly discuss and implement the necessary programmes of measures and work on characterisations, public consultation and awareness of water issues. Local authorities will be helped to implement regional integrated catchment management programmes through 'support and advisory teams' and staff will be intensified on this. In this way the regional level must feedback into the national level again.

Notwithstanding these (recent) efforts of **regional coordination** and the importance of the local authorities in the implementation of the WFD, the Irish approach is **collaborative**, but still relatively **centralised**, especially considering the fact that domestic resources (next to European funding) normally originate from the Ministries or from the EPA. But the special supporting office of LAWCO suggests that on the ground implementation is clearly more emphasised and the regional and county level become much more important (Interviews Ireland March 2018). With these structures being only a few years old, it is too early to assess the role of LAWCO. However, much is expected from the incentives the LAWCO's will give to both implementation and stakeholder management. The local monitoring system is expected to strongly improve, with more officers 'walking the water ways' with a view to both monitoring and guiding stakeholders and addressees (Interviews Ireland March 2018). This will lead to more insight in effectiveness of measures related to the WFD and the Nitrates Directive.

4.1.5. Multi-sector cooperative arrangements – Comparison

Most interviewees acknowledged that a centralised and rigid top-down approach causes problems when implementing the WFD in practice. In all the four countries/regions – Denmark, Lower Saxony, Flanders and Ireland – we see the **emergence of cooperative arrangements** with the aim to involve the **regional and local actors** during the implementation of the Water Framework Directive. In Lower Saxony and Denmark such regional and local arrangements seem to be relatively strongly institutionalised, in comparison to Flanders and Ireland, where they are only just emerging[2]. The idea is that regional cooperative arrangements enable an **area-specific management approach** that takes, on the one hand, the local physical characteristics into account, and on the other hand, the regional societal interests and problems. It should increase the **awareness** and **acceptance** of and the **commitment** to management measures. Other perceived advantages are, the possibility to tap into the **local knowledge** (see Denmark) or the development of a **regional network** of actors who know and trust each other (see Flanders and Lower Saxony).

Differences between cooperative arrangements

The previously described cooperative arrangements may be distinguished based on their **purpose**, their **area focus** and the way of involving **stakeholders**.

[2] In Flanders, to be sure, the CIW provides an example of strongly institutionalised multi-sector cooperation, but it is located at the central (Flemish) level (see section 4.1.3).

(1) The **purpose** of the various regional arrangements may differ between the countries. Some regional cooperative arrangements have a primarily **practice-oriented approach** concentrating on developing, planning and/or implementing concrete agricultural-based measures (e.g. Lower Saxon Drinking Water Cooperation) or mainly on hydro-morphological projects (e.g. Flemish integrated water projects, Lower Saxon Water Alliances). Others have additionally an **advice-oriented approach** focusing on providing input for and decision-making advice on the River Basin Management Plans (e.g. Danish water councils).
(2) The cooperative arrangement may be initiated for specific **areas**, for example areas with **a specific protection designation** (e.g. Drinking Water Extraction areas in Lower Saxony), areas with a **promising chance for improvement** (e.g. Flemish Integrated Water Projects, Lower Saxon Water Alliances), or on the **sub-basin level** or parts thereof (e.g. Danish Water Councils, Irish Water Forum, Lower Saxon Area Cooperations).
(3) Generally, representatives of various interests are **involved** in a **voluntary non-contractual** manner (e.g. Lower Saxon Area Cooperation, Flemish Integrated Water Projects, Danish Water Councils, Irish Water Forum). Only for the Lower Saxon Drinking Water Cooperations and the Water Alliances, **voluntary contracts** are made between a limited number of stakeholders (see 4.1.2).

Lessons: Experiences from cooperative multi-sector arrangements
The **effectiveness** of regional cooperative arrangement to implement measures that help reaching the goals of the WFD may be influenced by a number of factors. Giving stakeholders an **incentive** to participate, emerged from the comparison as an important facilitating factor. It appears that most of the regional cooperative arrangements essentially rely on the voluntary involvement of stakeholders. In all four countries, interviewees mentioned that lack of commitment is a common problem as water quality or something abstract as a 'Water Framework Directive' is often not a priority for local stakeholders. It is therefore beneficial to provide incentives for cooperation. These incentives might be quite diverse and could have a **rewarding** nature à la 'what's in it for me' or a **threatening** nature. For farmers, this may be a financial **compensation** (see Lower Saxon Drinking Water Cooperations), or **cost-savings** due to more efficient fertiliser usage (e.g. Ireland: Smart Farming, Drinking Water Cooperations). Notably, the benefits of a **good consultation service** for farmers has been stressed by interviewees as a very important factor to increase awareness for measures, but also to support the correct application of measures to create the highest benefit for water quality (see Drinking Water Cooperation). For local governmental authorities and citizens, incentives may be the possibility to combine multiple-interests, e.g. water quality protection with tourism or flood risk management. Establishing these synergies may help to break the dominance of, for instance, agricultural interests (Behagel & Turnhout 2013), create economic advantages and support the development of the region/city. Our findings furthermore suggest that having a **potential threat** looming on the horizon may also offer an incentive. In Ireland, Dairy Farms became active in water quality protection as they feared they could lose their 'green image', which may influence the export of dairy products negatively. In Denmark, participants of the water councils were cautioned that the ministry may decide on management measures if water councils could not find an agreement. In order to be able to make the decision themselves, they needed to overcome their diverging interests. Similarly, in Lower Saxony, farmers were reminded that regulatory requirements could be established if the water quality in drinking water areas would not improve.

The governance framework needs to strike a **balance between firmness and flexibility**. On the one hand, governmental authorities remain accountable towards the EU for the implementation of the WFD. Consequently, a regulatory framework that defines the general goals, tasks and responsibilities and ensures a certain benchmark appears to be necessary. On the other hand, flexibility is important so that regional stakeholders can shape the projects to the area-specific characteristics and can develop a feeling of ownership. Generally, countries try to balance flexibility and restriction by developing a catalogue of measures. From this catalogue, regional stakeholders can select and further design measures according to the local characteristics and interests. The moment when flexibility is given is hereby influential, which is illustrated when comparing the Danish and the Lower Saxon approach. In Denmark, the Water Councils were generally seen as a success, at least in the first round. Notably, the Water Councils were given a **specific task**, i.e. to select measures from a catalogue, but they were **relatively flexible in choosing and implementing** the measures. One may conclude that a lack of such a clear task was a weakness of the area cooperations in Lower Saxony. Additionally, the area cooperations were considered as too top-down regarding the deliberation, planning and implementation of measures by interviewees (see 4.3.2). However, the Danish example also shows that this task should not be too technical. In the second round, the task was to designate the status of water bodies as heavily modified or natural. This task was perceived as too technical by interviewees. All in all, one may conclude that the task needs to be in the realm of stakeholders' capabilities.

The presence of a **facilitator** who knows the **physical characteristics of the area**, but also has the **trust of local stakeholders**, appears to be another influential factor. In Denmark, the municipalities are knowledgeable and can support the cooperation in the water councils. Similarly, in Lower Saxony, the closeness of the maintenance boards to the stakeholders is perceived as a facilitating factor. In Ireland, the LAWCO is seen as an important facilitator that has the overview of various measures. The facilitator may also be capable to **balance different interests** and avoid the domination of one. In Lower Saxony, for example, the agricultural interests were in some area cooperations considered to dominate and hinder the development of measures (see also Behagel & Turnhout 2013). In Denmark, this issue was addressed by the municipalities who regulated the access to the Water Councils. The number of 'protectors' of the water bodies (e.g. environmental NGOs) and of 'users' of the water bodies (e.g. farmers or industry) has to be relatively equal. Under these circumstances, the cooperations on the regional level can also overcome politically hardened fronts between the environmental and agricultural interests that are still present on the national level yielding constructive results.

Having **sufficient financial means** available is an influential factor as well, as it increases the cooperative arrangements' capability to implement measures. There are different possibilities to finance the activities of cooperative arrangements. Applying for **European and national funds** is a common approach (e.g. Flemish Integrated Water Projects, Lower Saxon Area Cooperations). However, the application is often bureaucratic and resource intensive. An innovative approach to support the application may be the Lower Saxon **caretaker**, as it is a staff member solely responsible for the implementation of WFD projects. Consequently, s/he has the capacity to apply and may also gain experience on the application procedure. Having a specific **tariff to finance water quality measures** is another funding possibility (see Drinking Water Cooperations). An advantage is that this approach ensures a relatively stable provision of financial means available for this specific task. Nevertheless, in Lower Saxony the demand for the funds is high and it is not sufficient, notably, the tariff has also not been raised since its introduction in 1992. The state can, of course, also make a

budget available for the cooperative arrangements. In Denmark, the Water Councils had in total €93 million available in the first cycle, which was differently distributed among the councils depending on how many km streams needed to be restored. In comparison, the Lower Saxon area cooperations initially received less, but the same amount independent on their local situation, i.e. each area cooperation received €15,000 per year. Depending on the homogeneity of the water quality issue, it appears to be worthwhile to differentiate financial investments. But one needs to be aware of the equality implications this may cause.

Two further aspects for consideration in the context of regional cooperative arrangements shall be mentioned. In the context of prioritisation, both in Flanders and in Lower Saxony special attention is paid in **areas that are 'nearly at a good status/potential'**, so to say, to chalk up a success. However, this approach may potentially cause **long term problems**. Prioritising certain areas is in both regions seen as a necessary approach to demonstrate improvement towards the EU. However, such an approach also implies that some areas are put on a backburner or in the worst case are 'given up'. This may be particularly problematic if stakeholders need to be motivated in these left-behind areas to improve water quality. In a theoretical worst case scenario lacking any empirical evidence, one may imagine that when it is finally their turn to receive financing, the trust in the government and the commitment to the WFD might have completely vanished, hampering the possibilities to implement measures. Another consideration addresses the effectiveness of cooperative arrangement. It appears that the **legal and political framework needs to be supportive of and in line with the goal** of the cooperative arrangements. Regional cooperative arrangements cannot compensate counterproductive political trends that aggravate water quality, such as the unsupervised construction of biogas plants in Lower Saxony.

4.2. Regionalisation and differentiation of policies

Multi-level governance refers to the institutions and processes of central versus decentral decision making. A first key question to be addressed here is the relative influence of various (national, regional, local) **levels of decision making** on the implementation of the WFD. A second key question deals with the possibility of the **regional differentiation** of policies, for instance in view of differences in problem pressure or geographical characteristics.

4.2.1. Regionalisation and differentiation of policies – Denmark

Until recently, Danish policies implementing the WFD and the Nitrates Directive were predominantly uniform throughout the country. They took the form of, for instance, a top-down, generic system of mineral accounting and country-wide limits for animal manure applied to the land (Dalgaard et al. 2014; Thorsøe, Dalgaard & Graversgaard 2017). It was increasingly realised, however, that **spatially differentiated policies** could in fact be a more cost-effective way of dealing with water quality problems. These, after all, exhibit strong local variation as well (e.g. Dalgaard et al. 2014; Jacobsen et al. 2017).

A few examples of geographically differentiated policies can already be found in the 2000s and early 2010s (see the overview in Dalgaard et al. 2014), notably the requirement of establishing **cultivation-free riparian zones** under the 2011 Buffer Zone Act (Thorsøe, Graversgaard & Noe 2017). However, a more fundamental shift to a policy approach based on differentiation took place with the change of government in June 2015, when the Danish Liberal Party (and traditional farmers' party) *Venstre* took

office. In December of the same year, the new government issued the so-called Food and Agriculture Package (Ministry of Environment and Food of Denmark 2015) aiming for **a more 'targeted approach'**. The document referred to it as nothing less than a 'paradigm shift' in Danish agri-environmental policy (ibid., p. 1).

The differentiated measures proposed in the 2015 Food and Agriculture Package – and largely implemented in the meantime – include:

- An aid scheme for supporting the voluntary cultivation of **catch crops** aimed at reducing nitrogen leaching in specified vulnerable areas, amounting to a total catch crop area of 137,500 ha, i.e. around 5% of Denmark's farmland[3]. If the performance of the scheme turns out to be insufficient, it will be augmented or replaced by a mandatory scheme in 2019 (Ministry of Environment and Food/EPA 2017, pp. 19-20; Jacobsen et al. 2017, p. 102).
- A programme for stimulating the construction of **mini-wetlands** in designated areas. Also in this case, there is the option of shifting to mandatory rules in the future (see below, section 4.3.1).
- Replacement of the mandatory establishment of **cultivation-free riparian zones** under the 2011 Buffer Zone Act by the voluntary option to use such zones for complying with the requirements of 'green' payments under the Common Agricultural Policy (Ministry of Environment and Food/EPA 2017, p. 19).

Note that the differentiated measures established under the Food and Agriculture Package are all based on offering **financial incentives** (the 'carrot') and thus have a **voluntary** character. In a later stage, according to the Package, they may be followed by mandatory rules (the 'stick') if this is deemed necessary (Interviews Denmark February 2018; see also the literature cited above).

Although differentiated measures may be theoretically more cost-effective than generic measures, two key barriers to their implementation are recognised in the literature (Anker 2015; Dalgaard et al. 2014; Jacobsen et al. 2017; Thorsøe, Graversgaard & Noe 2017) and by our respondents: the problem of inequality and the increased demand for detailed data at local level. Both problems are related and become pressing especially when differentiated measures with an obligatory character are involved.

First, imposing differentiated requirements means imposing **unequal burdens** on farmers. Financial compensation could in principle take away this problem, but only if it is differentiated as well. Standard compensation brings with it the risk of over- or undercompensation (Thorsøe, Graversgaard & Noe 2017, p. 205). With reference to inequality, distortion of competitive conditions and violation of property rights, farmers successfully challenged the requirement to establish buffer zones under the 2011 Buffer Zone Act. In doing so were supported by an organisation of radical farmers (somewhat ironically called *Bæredygtigt Landbrug*, i.e. Sustainable Agriculture) that had been set up in 2010 as an alternative to the dominant farmers' organisation, the considerably more moderate Danish Agriculture and Food Council (Interviews Denmark February 2018; Thorsøe, Graversgaard & Noe 2017, p. 205). The ensuing court cases strongly contributed to the Act's eventual withdrawal in 2015 (Anker 2015; Thorsøe, Graversgaard & Noe 2017).

[3] This scheme comes on top of a general mandatory catch crop scheme, which however covers only the relatively limited amount of 34,000 ha (Ministry of Environment and Food/EPA 2017, p. 15).

Second, designing and implementing differentiated measures which (a) make true the promise of cost-effectiveness and (b) can be justified vis-à-vis individual farmers requires a **high amount of reliable, locally differentiated data** regarding both the ecological circumstances (soil, surface water, groundwater, ecological impact etc.) and farm practices (crops and crop rotation, fertiliser use and application etc.). Collection of such detailed data is difficult and highly resource-intensive. In the case of the 2011 Buffer Zone Act, farmers and farmer organisations argued that the scientific basis for establishing and locating buffer zones was insufficient. In the court cases mentioned, judges largely followed their argumentation (Interviews Denmark February 2018; Thorsøe, Graversgaard & Noe 2017).

As Thorsøe, Graversgaard and Noe (2017, p. 208) argue "there is a gap between the political ambitions of increasing differentiation and the ability of science to support this transition". Moreover, connecting the data problem with the issue of equality, "more science will not stop stakeholders feeling unevenly treated (general regulation was not met with less opposition because the scientific foundation was better, but because stakeholders were treated similarly)" (ibid., p. 209).

Starting with the opposition to the Buffer Zone Act and with even more intensity since the publication of the Food and Agriculture Package, the justification of differentiated measures plays a key role in the current Danish debate about the WFD and nutrients policy (Interviews Denmark February 2018). A certain degree of unequal treatment may be legally and politically acceptable (Anker 2015), but only if it comes with firm scientific evidence. However, providing the required scientific basis is problematic. The issue may be aggravated by the fact that Danish water and nutrients policy has a strongly top-down character. Differentiation, leading to locally different norms and measures, still has to be regulated and justified at the central level. This brings is with it the **risk of a 'data trap'** in which differentiated policies formulated at the central level lead to an increased data demand 'on the ground', i.e. at the local level. Consequently, the original policies are being called into question and reformulated, which in turn leads to new data demand (Interviews Denmark February 2018). Thorsøe, Graversgaard and Noe go as far as referring to differentiated regulation as a 'dream' (ibid., p. 209).

4.2.2. Regionalisation and differentiation of policies – Lower Saxony

In Lower Saxony, the investments in and requirements on areas are differentiated for (1) drinking water extracting areas (see 4.1.2), (2) focus areas, i.e. areas characterised by promising potential for improvement (see 4.1.2), and (3) nitrate sensitive areas, i.e. areas characterised by poor quality. Whereas the former two, i.e. drinking water extracting areas and focus areas, were covered already in section 4.1.2, differentiated policies for **nitrate sensitive areas** will be discussed below.

Multi-level institutional setting and EU infringement procedure

As Germany is a federal state, the federal level sets the legal frameworks for implementing the Water Framework Directive, i.e. the Federal Water Law (*Wasserhaushaltsgesetz*) and for operational issues, e.g., the Fertiliser Ordinance (*Düngeverordnung*). The latter is particularly relevant for regulating diffuse pollutions from agricultural activities. Notably, the *Länder* have the competence for operational implementation. They develop *Länder*-specific legislation, i.e. specify goals, measures and organisational structures, within the boundaries of the federal frameworks (for a comprehensive overview see Kastens & Newig 2007).

In 2016, the EU Commission initiated an **infringement procedure** against Germany as the former Fertiliser Ordinance was considered to be too weak and insufficient to achieve the goals of the EU Nitrate Directive. According to interviewees, this procedure accelerated the long-standing national discussions concerning an update of the Fertiliser Ordinance and functioned as an effective threat (Interviews Lower Saxony February/March 2018). Agricultural and environmental/water-related interests had been opposing each other for several years. Eventually, instead of establishing a German-wide strict regulation a compromise was found by delegating the power to establish additional requirements to the *Länder* level. This compromise is seen critical by the Environment Ministry of Lower Saxony as it basically shifted difficult discussions between agriculture and water interests on to the next level. In case of a conviction by the European Court of Justice, moreover, a possible fine can be legally transferred to the *Länder* (Interviews Lower Saxony February/March 2018).

Differentiating nitrate sensitive areas

Paragraph 13 of the updated Fertiliser Ordinance enables the *Länder* to autonomously enforce **additional requirements** to reduce nitrate and phosphate pollution in areas which are assessed with a bad chemical status according to the federal groundwater regulation (2010) or the surface water regulation (2016) (§13 Düngeverordnung 2017). The Fertiliser Ordinance also implies less strict regulations in areas with good status (Interviews Lower Saxony February/March 2018). The *Länder* may choose to make use of the competences (Interviews Lower Saxony February/March 2018). The federal Fertiliser Ordinance prescribes a number of measures that can be imposed on these nitrate sensible areas. The *Länder* may select the most appropriate measures when establishing their *Länder*-specific manure regulation but are not allowed to deviate from the list given by the Ordinance. The list includes, for example: retention periods (*Sperrfristen*), the prohibition to apply fertiliser with phosphate, the demand to keep 5m, 10m or 20m distance to water bodies when applying manure, or the demand to handle a control standard of 40kg N/ha per year instead of 50kg N/ha (§13 Düngeverordnung 2017). Differentiated nitrate balances are not part of the preselected list of measures as this would cause differences between the *Länder*, which was criticised by the EU. Which measures will actually be included in the *Länder* regulation depends on the outcome of the upcoming political discussion. Consequently, considering that some of the listed measures do not present a heavy burden to the agricultural sector, the Ordinance´s eventual effectiveness in terms of water quality remains to be seen (Interviews Lower Saxony February/March 2018).

Even though the regulation will be further developed by the agricultural ministry, the **geographical delineation** will be done by the environmental ministry and its implanting agency. The Lower Saxon agency NLWKN is responsible for identifying and sharply delineating these nitrate sensible areas (Interviews Lower Saxony February/March 2018). For this purpose, the **monitoring** was refined. In Lower Saxony, there are 123 groundwater bodies, which are relatively large and heterogeneous. These are further distinguished into type areas (*Typflächen*) (Interviews Lower Saxony February/March 2018; NLWKN 2014). The distinction is based on soil characteristics, hydrochemical and hydrogeological assessments (NLWKN 2014). Eventually, 409 type areas are distinguished. The delineation for differentiation would be based on these type areas (Interviews Lower Saxony February/March 2018).

Evaluation and potential future discussions

The Lower Saxon interviewees generally perceived the possibility to spatially differentiate requirements as a compromise settlement as national-wide requirements were politically not possible. Under these political circumstances, the possibility for differentiation was welcomed as a positive development as it is seen as a necessity to improve water quality. However, it is also expected that difficult discussion may arise once it is clear what kind of measures will be selected. As no decisions have so far been made, no lawsuits have been sued as yet. One discussion may surround the **delineation of areas** and how much of an area needs to be situated in the nitrate sensitive areas to fulfil certain requirements. Authorities try to avoid this discussion by sharply delineating the areas based on borders of property ownership. Another discussion may arise regarding the **monitoring** network and whether it is representative (Interviews Lower Saxony February/March 2018). To increase the control and oversight on the farm-level, Lower Saxony considers the establishment of a digital data synchronisation approach (see 4.3.2). The Chamber of Agriculture (*Landwirtschaftskammer*) is the specialist authority responsible for examining the implementation of the Fertiliser Ordinance. As it is historically also an interest group of the farmers, its organisation has been restructured in the last years establishing a Manure Agency with a supposedly independent audit authority reporting directly to the ministry (Interviews Lower Saxony February/March 2018). Lastly, discussions may arise concerning the **fairness of competition** and in how far the state is allowed to regulate free competition (Interviews Lower Saxony February/March 2018). Hereby, unequal requirements may play a role in terms of differences between *Länder* and within *Länder*.

4.2.3. Regionalisation and differentiation of policies – Flanders

In Flanders, two types of differentiation can be distinguished: (1) temporal differentiation, i.e. the prioritised areas *speerpuntgebieden* and *aandachtsgebieden* characterided by promising potential for improvement (see 4.1.3), and (2) differentiation based on water quality affected by agricultural practices, discussed below.

Differentiating focus areas

The Flemish Manure Decree and its so-called Manure Action Programme (MAP) addresses the diffuse pollution of agriculture. The current MAP (MAP5, 2015-2018) focuses on **spatially differentiated policies** (*versterkte gebiedsgerichte aanpak*). Each year some specific areas will be qualified as **focus areas** (*focusgebieden)***,** i.e. areas where the nitrate concentrations in the surface water exceeded the norm of 50 mg NO3/l or where the evolution of the nitrate concentration in the groundwater shows insufficient progress. An area designated as focus area retains this status for at least two years. The status of focus area can only be lifted after two consecutive positive evaluations of both surface water and groundwater. The geographical delineation is carried out by the Flemish Land Agency (*Vlaamse Landmaatschappij*) and its Manure Bank (*Mestbank*) and is made possible by the presence of a **dense monitoring network** which has existed in Flanders since the late 1990s**.** This network focuses, as much as possible, on the **influence of agricultural practices** on water quality and consists of 750 MAP-measuring network points for surface water (the so-called *MAP-meetnet*) and 2100 groundwater measuring wells (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015, 2018b; Vlaamse Milieumaatschappij 2017).

Focus farm by location

The geographical delineation of focus areas (poor water quality) and non-focus areas (good water quality) is not without consequence for Flemish farmers. Farmers that have more than 50% of their farmland located within a focus area, become a **focus farm by location** (*focusbedrijf door ligging*, see figure 4.2).

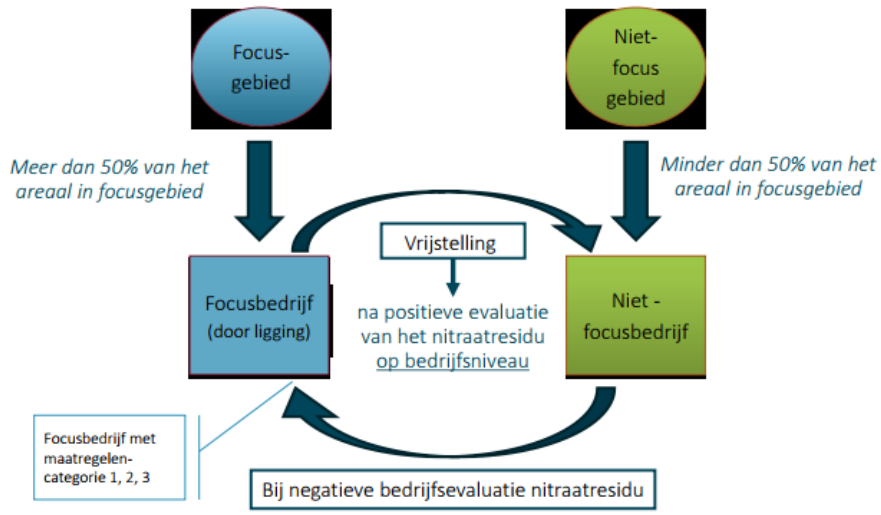

Figure 4.2: Relationships between focus areas and non-focus areas and between focus farms and non-focus farms
Source: Vlaamse Landmaatschappij 2017, p. 5.

'Focus farms by location' face **additional requirements** to reduce nitrate leaching from arable land **without any financial compensation** in return. First, they have a stricter scheme for applying manure to the land, e.g. shorter periods for applying manure to the land. Furthermore, they have to sow catch crops on each agricultural plot taking into account the cultivation and soil. Finally, these farms are faced with lower threshold values for nitrate residues compared to non-focus farms and have a higher chance to be selected for the inspection of nitrate residues (*nitraatresiducontroles*)[4] by the Manure Bank (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015, 2016).

Spatial differentiation, in other words, is also translated to **enforcement**. In focus areas there is more intensive overall inspection by the Manure Bank although this agency is aware that it has to assure a balanced enforcement across Flanders to prevent the deterioration of water quality in non-focus areas (Vlaamse Landmaatschappij 2015). A recent example of a differentiated approach of enforcement is the inspection of the mandatory one meter buffer zone along watercourses. The Minister of Environment, Nature and Agriculture decided that inspectors of the Manure Bank have to intensively monitor farmers' compliance in the focus areas, while monitoring compliance is not prioritised and left to the water management authorities in non-focus areas (Interviews Flanders February/March 2018; Vilt 2017).

Flemish farmers' organisations support this system of spatial differentiation. They subscribe to the notion that comparatively more should be done in areas where problem pressure is high and they do

[4] A farm with less than 50% of its farmland located within a focus area or a farm located within a non-focus area could also become a focus farm based on the nitrate residue measurements. This will be further discussed in section 4.3.3.

not question the measurement data underlying the system of differentiation. In fact the farmers' organisations had themselves requested the identification of critical areas because, in their view, not all farmers should be 'punished' with stricter measurements. Farmers' organisations, the Flemish Land Agency and the Flemish Department of Agriculture and Fisheries are all in favour of a continuation of the current system of spatial differentiation in the next MAP, starting in 2019 (Interviews Flanders February/March 2018).

Exemption procedure

In 2017 **almost 10.000 farms** were focus farms by location covering a total agricultural area of 222.533 hectares (i.e. around 34% of a total of approximately 650.000 hectares of farmland) (Vlaamse Landmaatschappij 2018b). This substantial amount could have been higher, but **2341 farms** were **exempted** from the additional mandatory measures. Farmers who are by definition 'focus farm by location' – more than 50% of their farmland is located within a focus area – may provide proof of evidence to the contrary on the basis of a standardized procedure. By measuring the nitrate residues on a representative number of plots, taking into account the cultivation and the size of the farm (*bedrijfsevaluatie*), the farmer may prove that nitrate levels are sufficiently low to prevent nitrate leaching to water courses or the groundwater. If this is the case, the farmer obtains the exemption and is classified as a non-focus farm (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015, 2018a).

The exemption procedure could be seen as a '**reversed burden of proof'**: farmers have to prove at their own cost that they do not contribute to the pollution of water in the surrounding area. In this context, the interviewees attribute a crucial role to the dense monitoring system (Interviews Flanders February/March 2018). The data produced by this monitoring system provided the Flemish government with a firm basis for identifying agriculture as the main cause of nutrients pollution and establishing a differentiated system for dealing with this problem. These monitoring data and the differentiated system derived from it are generally accepted by the farmer organisations. Although details of the system are of course subject to regular discussion[5], no lawsuits have been sued to contest the label 'focus farm by location'. As mentioned, farmer organisations asked themselves for this differentiated system and designed the current manure policy in a very participatory manner with the Flemish authorities.

4.2.4. Regionalisation and differentiation of policies – Ireland

Ireland shows strong territorial differences with regard to the opportunities and scale of agriculture and industry, with very different conditions in the west of the country compared to the north and south east - therefore it also shows a great variety in water quality. On the basis of specific risk profiles, there is a distinction between **prioritised high status areas**, where rivers and lakes are relatively pristine and were the situation should be preserved, mostly in the west part of the country, and **areas**

[5] First, if 1 of the 12 annual measurements of a specific MAP-measuring point has exceeded the norm of 50 mg NO3/l, that point becomes 'red' and the surrounding area becomes a focus area. One can say that one exceedance could be an outlier, in particular when the standard is only just exceeded. Second, the demarcation based on the groundwater monitoring system is disputed, because of the underground water streams which the farmers do not necessarily affect. Finally, there is discussion about the extent to which weather conditions should be taken into account. Currently, farmers who feel that measurements have been negatively affected by the weather may submit an appeal to. The Manure Bank will then look if the objections are justified (Interviews Flanders February/March 2018).

that deserve special attention with regard to nitrogen and phosphorus (EPA 2012) in the south and south-east and in some parts of the northern border regions. Larger scale dairy farming, for example, is mostly to be found in the south and southeast of the country.

The Department of Agriculture, Food and the Marine (DAFM) has funded research on the impact of agriculture in **high status areas** (named HARMONY, Department of Housing, Planning and Local Government 2018, p. 103): "The project aims to integrate agri-environmental research with socio-economic tools to provide evidence-based measures for nutrient management in these sensitive catchments. Agriculture in these areas is typically extensive, and inadequate nutrient management on farms can cause a significant pressure in sensitive catchments. The research has identified a low uptake of soil testing and nutrient-management planning within each catchment, which leads to inefficient fertiliser use and poor redistribution of nutrients across the farm" (Department of Housing, Planning and Local Government 2018, p. 103; Interviews Ireland March 2018). In other words, the policy in Ireland is directed towards '**keeping cleaner areas clean**'. Another example of this is the so-called **Blue Dot Catchments Programme** that wants to establish a network of river and lake catchments and provide a means of focusing attention and resources across a range of agencies "where the objective is to protect and restore high ecological status" and to "provide a means of focussing attention and resources across a range of agencies with the aim of protecting, and where required, restoring high ecological status." (Department of Housing, Planning and Local Government 2018). High status areas have also priority in general schemes such as the **Green Low Carbon Agri-Environment scheme** (GLAS). The GLAS programme is "conditional on the farmer undertaking water protection measures including, as appropriate, fencing to prevent cattle access or establishment of riparian margins" (Department of Housing, Planning and Local Government 2018). In the draft RBMP it is stated that the water protection measure has the second highest uptake of all GLAS measures (Department of Housing, Planning, Community and Local Government 2017, p. 75).

In the areas that are much more vulnerable to diffuse pollution from agriculture or industry there are different area-based policies. The catchment characterisation process of the EPA found agriculture to be "a significant pressure in approximately 53% of water bodies identified as At Risk" (Department of Housing, Planning and Local Government 2018). This is related to excess nutrients, but also to chemicals (including those used in pesticides and sediment losses because of poor land management. In Ireland there is specification of rules concerning the **nutrients sensitive areas**, which are designated under the Urban Waste Water Directive and there are protective measures for shellfish waters, including mussels. There are targeted agri-environment schemes under the Rural Development Programme (RDP) 2014-2020, Agricultural Catchments Programmes (Agriculture and Food Development Authority 2017) and there is much emphasis on knowledge transfer and monitoring of water quality impact and the widespread adoption of best practices. However, all if these projects are **voluntary** measures, there are no mandatory schemes that are also regionally differentiated.

Differentiation also exists in the form of derogation measures related to the EU **Nitrates Directive**. This pertains to dairy farmers and may have a regional effect. The agri-food strategy in Ireland is directed to growth of dairy farming, also for the international market (China), so dairy production is expected to increase in animal numbers. At present, 7,000 farmers, predominantly dairy farmers, "are availing of a higher stocking-rate allowance under the nitrates derogation. These derogation farmers are subject to stricter controls, such as mandatory nutrient-management planning and soil sampling,

annual submission of fertiliser accounts and an increased level of field inspection" (Department of Housing, Planning and Local Government 2018, p. 53). Therefore, in case of this formal derogation, there is differentiation, just like in other countries too. However, this not regional differentiation as compared to, for example, Flanders.

4.2.5. Regionalisation and differentiation of policies – Comparison

Spatial, multi-level differentiation of WFD and nutrients policies has been on the political agenda at least for some time in all countries in our sample, but when it comes to the actual **implementation of differentiated measures** the four countries show a **widely divergent picture**.

Most advanced in spatially differentiating policies and measures is no doubt **Flanders**. As discussed above (section 4.2.3), it has a full package of measures in place for farms that are located in so-called focus areas where nitrate concentrations exceed 50 mg/l. These areas cover more than 30% of all Flemish farmland. The measures involved include shorter periods for applying manure to the land and requirements for the cultivation of catch crops. These measures, moreover, are mandatory. In **Denmark** (see section 4.2.1), the Ministry of Environment and Food initiated what it claimed to be a 'paradigm shift' to a more 'targeted', i.e. a more differentiated, approach. However, measures to this end, including for instance a catch crop scheme and the construction of mini-wetlands, have so far been implemented only on a 'carrot-and-sermon' basis, i.e. voluntarily and supported by tailor-made advice to farmers and financial compensation (see also section 4.3.1). If these measures do not bring sufficient result, mandatory forms of differentiation have been announced from 2019-20. Since the 2017 revision of the German federal Fertiliser Ordinance has granted to the *Länder* the freedom of differentiating nutrients policies, **Lower Saxony** has started discussing the option of imposing stricter requirements in regions with high nutrients pressure (see section 4.2.2), but no actual measures have been implemented so far. In **Ireland**, finally, differentiation seems to be aimed primarily at protecting areas which (still) have a relatively high, rather than a relatively low ecological status. It must be noted here that also in other countries, e.g. Flanders and Lower Saxony, arrangements exist with regard to areas with a good status, for instance to prevent deterioration from the outset or to act as 'show cases' for the successful implementation of the WFD (see also section 4.1).

What may **explain these differences**? An obvious candidate is problem pressure, but this parameter is hardly able to explain straightforwardly the different degrees of spatial differentiation between the four countries. Regional or local problems with regard to nutrients may be more serious in Flanders than in Ireland, but there is no indication that they are considerably more serious than in Denmark or Lower Saxony.

Pressure by the EU played an important role in launching the debate about differentiation in Germany. The opening of an infringement procedure by the Commission in 2016 made clear that the framework measures currently in place at the federal level would not suffice to achieve the goals of the Nitrates Directive. As the conclusion of more ambitious measures at the federal level turned out to be impossible due to political deadlock, moreover, this led to the revision of the Fertiliser Ordinance, offering the *Länder* the voluntary possibility to establish stricter measures in those areas where they are most needed. Here the factor of problem pressure becomes relevant in second instance. As Lower Saxony houses some of the areas with the highest concentrations of intensive livestock farming in Germany, the option of territorial differentiation is almost certainly going to be used. If not, the federal

level actually has the legal possibility to shift a possible future fine imposed by the EU Court of Justice to the *Länder*. In that sense, remembering *The Godfather*, the 'option' of differentiation enshrined in the Fertiliser Ordinance may well have been seen in Lower Saxony as an offer that could not be refused. Speaking more generally, to be sure, the obligations established by the WFD and the Nitrates Directive, among others, are key drivers of change in water policy in all Member States.

A crucial factor for explaining the speed and success of introducing differentiated measures appears to be the **availability of reliable and broadly trusted data**. In Flanders, the MAP measuring network had been established already from 1999. It's over 750 measuring points for surface water, existing in addition to the general network for measuring water quality in Flanders, are aimed at assessing the impact of agricultural practices only (Vlaamse Milieumaatschappij 2017). Over the years, the MAP network had acquired a considerable degree of trust also among farmers. Around 2015, the data produced by the network could thus provide the basis for a relatively uncontroversial designation of the Flemish focus areas[6]. Relatively, that is, in particular in comparison with Denmark where data were seriously challenged for being insufficient and unreliable. The risk of a '**data trap**', i.e. the continuous demand for more and more detailed data, may in fact pose a serious threat to further differentiation, especially considering that the carrot and the sermon may in the future need to be replaced by the stick. Although the number of 750 measurement points in addition to the regular monitoring network for water quality in Flanders is comparatively high (cf. Miljø- of Fødevarelseministeriet/Naturstyrelsen 2016), this is not to say that the Flemish data are 'better' than the Danish ones. The point is that they are seen as more reliable and trustworthy by a wide range of stakeholders. In Germany, actors seem to have only just realised the possible emergence of a data problem. Anticipating on this, the Fertiliser Ordinance has created room for the flexible use of data protection requirements by the *Länder*. The government of Lower Saxony intends to tackle the data problem by connecting ecological data to data on agricultural practices at farm level. However, much of this will need to be carried out by the Chamber of Agriculture (*Landwirtschaftskammer*), which is a corporatist institution combining interest representation with service to its members and implementation of delegated public tasks. This makes the policy heavily dependent on harmonious cooperation with the agricultural sector.

By definition, policy differentiation implies that rules are not applied uniformly and, thus, that farmers (or other actors, for that matter) are treated differently depending on local circumstances. As set out above, this can only be justified with reference to sufficient, reliable and trusted data. However, also more fundamental **questions of equality and inequality** – and how a given society deals with those questions – play a role here. This relates, first, to the general political culture. In a large federal state like Germany, differences among regions implying also regional differences in regulatory regimes appear to be much more accepted than in for instance Denmark, a small unitary state with a strong 'Scandinavian-type' ideology of equal treatment. Second, and directly related to this, is the question of compensatory measures: whereas in Denmark compensation payments seem to be an almost essential lubricant for the introduction of differentiated measures, the issue of compensation has so far played a considerably less prominent role in the German debate about differentiation. In the Flemish focus areas, stricter requirement have been implemented without significant compensatory measures.

[6] Note that the Flemish focus area scheme even includes enhanced enforcement efforts in those areas and a reversed burden of proof for farmers claiming an exemption from the scheme.

This, in turn, is related to a third factor: the **organisation of agricultural interest representation**. In Denmark, a key role is played by the Agriculture and Food Council, a private organisation representing the large majority of Danish farmers which may, at times, take strong positions vis-à-vis the government. Since 2010, the debate has been further polarised by a new farmers' organisation, defending the interests of the farmers in a more radical way than the well-established Agriculture and Food Council. In Germany and Flanders, the relationship between farmers' organisations and the government are closer. A more consensual culture prevails with the Chamber of Agriculture in Lower Saxony even exhibiting traditional corporatist traits (see above). In Denmark, finally, water pollution stemming from agriculture has been a highly visible bone of contention for subsequent minority coalitions ever since the 1990s (Andersen 1997). This has not been the case to that extent in Germany and Flanders. In Ireland, a broad political consensus seems to exist at least in principle on pursuing and promoting the 'green' image of Irish agriculture.

As regards spatial, multi-level differentiation of WFD and nutrients policies, in sum, a picture emerges which is also highly differentiated. **Quite different models are chosen in different countries**, ranging from **mandatory** differentiation on a fairly large scale in Flanders to differentiation on a '**carrot-and sermon**' basis in Denmark. A better understanding of the factors explaining these differences may help to see which opportunities and barriers would exist when it comes to differentiation in the Netherlands. Key factors include the availability data that are broadly regarded as reliable and trustworthy, and the way of dealing with questions of equality in the agricultural sector. In addition, problem pressure and pressure by the EU may help to explain the differences observed among the sample countries.

4.3. Mix of instruments regarding nutrients and diffuse pollution by agriculture

This theme revolves around the mix of instruments that are applied while implementing the WFD. We have focused on dealing with diffuse pollution by agriculture (phosphates and nitrates from agricultural sources). With using **sticks**, or 'command and control' regulation, it is referred to coercive regulatory instruments, for example manure regulation (standards of application of manure, open or closed periods, transport obligations, administrative obligations etc.), regulation of volume of production (rights of production or right of emissions) as well as to relatively intensive monitoring, control and enforcement. **Carrots** refer to subsidies to stimulate good agricultural practices, very often through EU or national funding (rural development plans, integrated catchment programmes, other EU programmes, as LEADER) and implemented through agri-environmental schemes, compensation schemes for loss of income, etc. **Sermons** include guidance, communication and consultation, i.e. instruments to 'seduce' people to internalise the care for water quality and to feel responsible themselves.

4.3.1. Mix of policy instruments – Denmark

WFD policy in Denmark started out in the 2000s with relatively high ambitions. After some years, cost-effectiveness started to play an increasing role in the debate and a gradual **shift in emphasis from mandatory to more voluntary policy schemes** was observed (Bourblanc et al. 2013; Jacobsen et al. 2017; Thorsøe, Dalgaard & Graversgaard 2017; Interviews Denmark February 2018; see also above, section 4.2.1). An important turning point occurred around 2009. It can be related to increasing concern in the powerful agricultural sector about the costs of WFD-related measures (as laid down for instance in the ambitious 2009 Green Growth Agreement), problems in living up to the deadlines set

by the WFD (Denmark was late in submitting the first round of RBMPs) as well as the economic crisis (Bourblanc et al. 2013; Wright & Jacobsen 2011; Interviews Denmark February 2018). As a second turning point it is often pointed to the liberal minority government which took office in 2015 and its **Food and Agriculture Package** (Ministry of Environment and Food of Denmark 2015; see above, section 4.2.1). The Package put strong emphasis on the economic feasibility of the agricultural sector. Apart from heading for more geographical differentiation of measures (see above), it replaced the mandatory scheme for additional catch crops by a voluntary scheme, abandoned the mandatory buffer zones along watercourses and relaxed the maximum amount of livestock manure to be applied to the land[7] (Anker 2015; Jacobsen et al. 2017; Ministry of Environment and Food/EPA 2017; Interviews Denmark February 2018).

In order to avoid higher nitrogen leaching due to the relaxation of measures, the Food and Agriculture Package introduced a number of alternative measures (Ministry of Environment and Food/EPA 2017). One of the most interesting of those measures is the **establishment of mini-wetlands**. Mini-wetlands are constructed at farm level and have a size of 0.5-max 2 ha. Acting as nitrogen sinks, they are claimed to reduce nitrogen losses by up to 25 percent (Ministry of Environment and Food/EPA 2017, p. 18). The government expects about 1,000 mini-wetlands to be constructed until 2021. Together they are estimated to reduce the nitrogen load to Danish coastal waters by 900 tonnes N/yr, which amounts to around 2% of the total land-based nitrogen load on coastal waters in Denmark (ibid.).

As optimal location of the mini-wetlands is crucial for their effectiveness, municipalities are involved in the detailed planning of the mini-wetlands and farmers are advised individually by a team of 25 **catchment officers** (together around 15 FTE), operating throughout the country. Specific training of the catchment officers was financed by EU Rural Development Funds and conducted by SEGES, the research and innovation centre of the Danish Agriculture and Food Council. The Council, which is the principal Danish farmers' organisation, actually claims to have initiated the scheme in the first place, following a Swedish example (Interviews Denmark February 2018; Lindahl & Söderqvist 2004). **Construction of the mini-wetlands** (appr. 30-40.00 Euros each) will also be covered by EU Rural Development Funds[8], whereas an **annual compensation** for the loss of land (appr. 500 Euros/ha/yr) will be paid by the Danish government (Interviews Denmark February 2018). The mini-wetlands programme will run for three years (2017-2020). The first round of applications was closed on 1 April 2018 and attracted considerable interest from farmers. This may be partly due to speculations among farmers that stricter and possibly more obligatory targets and measures may be (re-)introduced in the coming years, then perhaps accompanied by less favourable financial arrangements (Interviews Denmark February 2018).

[7] It must be noted here that the maximum amount of nitrogen contained in manure from pig, poultry and fur animal farming applied to the land used to be 140 kg N/ha/yr. in the period 2002-2017. From 2017, this was relaxed to 170 kg N/ha/yr., which is still within the limit of the EU Nitrate Directive (see Ministry of Environment and Food/EPA 2017).

[8] In Denmark, there are lots of complaints about the bureaucratic burden and the strict requirements involved in using EU Rural Development Funds. One interviewee mentioned the anecdotal example of a farmer who wanted to construct a mini-wetland on his land and proposed to put a bench next to it for hikers wishing to enjoy the view. He then found out that this would turn the agri-environmental project into a touristic project, which would imply different funding rules (Interviews Denmark February 2018).

The mini-wetlands scheme thus offers an interesting **mix of a 'carrot'** (in the form of financial compensation) **and a 'sermon'** (targeted advice by trained consultants). The 'stick' has so far been absent in relation to the construction of mini-wetlands. This is perfectly in line with the approach chosen in the 2015 Food and Agricultural Package. As mentioned above (section 4.2.1) and stressed by several of our respondents, however, it may not be excluded that more mandatory measures will be (re-)introduced in the future if the approach of the Food and Agricultural Package does not bring the desired results (Interviews Denmark February 2018). Using the carrot and/or the sermon, followed if necessary by the stick, is sometimes referred to in Denmark as the 'hybrid model'.

Previously it was observed that locally 'customised', differentiated policies and measures require high amounts of monitoring data and/or detailed modelling of local circumstances. Arguably, this is even more so if these policies and measures are mandatory. Further pursuing the case of the mini-wetlands: a voluntary 'carrot-and-sermon' scheme, such as the one currently in place, can rely on data that are sufficiently precise to allow for indicative planning at municipal level of the optimal location of the mini-wetlands, in combination with well-trained consultants offering advice at farm level. In contrast to this, a mandatory scheme, steering the construction of mini-wetland either directly or via strict leaching targets, could – at least in the Danish context – only be justified with the help of detailed and reliable data on farm level. Along this line, it could be argued that the approach of the Food and Agricultural Package actually helps to avoid (or postpone?) the sharpest edges of the 'data trap' discussed earlier (section 4.2.1).

4.3.2. Mix of policy instruments – Lower Saxony

In Lower Saxony, a mix of instruments is applied to address diffuse nutrient pollution: **subsidies** (e.g. *Agrarumweltmaßnahmen*), **regulatory instruments** (e.g. Fertiliser Ordinance) and **consultation** (e.g. *Trinkwasserschutzkooperationen*, already discussed in section 4.1.2 above). In 2000, the opposition against the Water Framework Directive was relatively high. Therefore, and in view of the fact that mandatory measures legally cannot be funded or subsidised, it was decided to focus mainly on voluntary measures, e.g. subsidies and consultation, with little coercion (Interviews Lower Saxony February/March 2018).

Experiences with subsidies

A common subsidy is the **EU Regional Development Programme** (e.g. *Agrarumweltmaßnahmen*). It compensates farmers for revenue losses or increased farming expenditures, among others, in WFD-relevant areas. It compensates, for example, cultivation of catch crops. Authorities wanted to establish a cooperative approach and extend the positive lessons from the drinking water cooperations by combining consultation with subsidies (see 4.1.2) (Interviews Lower Saxony February/March 2018; Reiter et al. 2016, p. 37). However, the uptake of *Agrarumweltmaßnahmen* by farmers was limited. In 2013, the measures were only implemented on 25% of the eligible area staying behind the expectations (Reiter et al. 2016, p. 37). In contrast to the drinking water areas, the consulting service in the specified WFD-relevant areas was a lot less intensive focusing mainly on group consultations and information letters, which was perceived as less effective. Even though farmers were involved in developing packages of measures, their input was not visible in the result, which appeared to have caused quite some frustration according to interviews. In general, interviewees receive the *Agrarumweltmaßnahmen* as too bureaucratic and restrictive. Possibilities to flexibly shape measures and adjust them to the area specificities are limited. The long-term commitment of 5 years is seen as

too long by interviewees offering few possibilities to respond to changes in agricultural practices (Interviews Lower Saxony February/March 2018).

This example illustrates that the **effectiveness of a voluntary approach and subsidies may be limited if the provision of information and consultation is not sufficient and/or when there is little incentive** to take up the subsidies, for example in the form of a (future) stick. Another hampering factor is the **restrictiveness** of measures. If the measures offer little room for flexibility and little possibility for farmers to actively shape and participate in the development of these measures, farmers may not develop a feeling of ownership or appreciate the potential economic advantages of these measures. Consequently, one may argue that subsidies need to be combined with more regulatory instruments, such as the Fertiliser Ordinance. Whether Lower Saxony may shift towards more regulatory instruments will be an upcoming discussion for the third round of River Basin Management Plans (Interviews Lower Saxony February/March 2018).

The regulatory approach – The updated Fertiliser Ordinance

The Fertiliser Ordinance, as such a regulatory instrument, used to be criticised as it gave little opportunity for **enforcement** due to limited inspections and insufficient sanctions in case of poor compliance (LAWA 2014). Another major shortcoming was the lack of obligatory **data reporting** on manure usage and the lack of central data collection (Interviews Lower Saxony February/March 2018; LAWA 2014).

The updated Fertiliser Ordinance enables **automatized data collation and synchronisation** (§13.6 Düngeverordnung). Farmers already have to report a considerable amount of information, but until now the data remained fragmented. With the updated federal Fertiliser Ordinance, the *Länder* get the authority (1) to combine different databases (e.g. InVeKoS, veterinary, animal epidemic) and (2) to demand a digital reporting of the nutrient balances and the 'fertiliser requirements' to see whether the farmer is using manure above the need of the plant (§13.6 Düngeverordnung 2017; Interviews Lower Saxony February/March 2018). With the automatized data synchronisation authorities can double check how plausible the data reporting is. Ideally, all involved authorities should get access to this database (Interviews Lower Saxony February/March 2018).

In general, the updated Fertiliser Ordinance is perceived by all interviewees as a political compromise (see 4.2.2.), but at the same time as an improvement to the old Fertiliser Ordinance (Interviews Lower Saxony February/March 2018). Nevertheless, still stricter and more enforceable regulations would have been preferred by some interviewees (Interviews Lower Saxony February/March 2018; see ZFK 2017). The automatized data synchronisation is generally seen as a necessary and promising development as it will improve the possibilities to control and enforce compliance (Interviews Lower Saxony February/March 2018). However, transposition of the system into Lower Saxon law will still depend on the political discussions between the agricultural ministry and the environmental ministry.

4.3.3. Mix of policy instruments – Flanders

In Flanders emphasis is put on **regulatory instruments** to address diffuse nitrate pollution. In section 4.2.3 it was discussed how the Flemish Manure Decree and the Fifth Manure Action Programme (MAP5) address diffuse pollution by agriculture by focusing on spatially differentiated policies. However, there is another important focus of MAP5, i.e. its **business-oriented approach** to control and

enforce compliance (Vlaamse Landmaatschappij 2015). This means that farmers may not only be confronted with additional measures because of their location (see section 4.2.3), but also due to their individual business management.

Background of the business-oriented approach

In MAP5 the Flemish authorities, notably the Manure Bank, made a shift from more administrative enforcement to site inspections on farm level; a shift that was supported by the farmers' organisations (Interviews Flanders February/March 2018). Individual farmers could be visited for the measurement of nitrate residues on plot or farm level (*nitraatresiducontroles*), to analyse their entire business activities (*bedrijfsdoorlichting*), and to check their manure practices on plots (so called *VODKA-actie*) (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015, 2018b). This is an interesting **toolbox of complementary instruments**, first, to sensitize farmers about the impact of their practices on water quality and, second, to enhance enforcement of existing measures, if necessary by way of sanctions or penalties in case of (major) violations (the 'stick').

The strength of these predominantly regulatory and monitoring instruments is that they allow for enforcement at the farm level. In this context, the **Manure Bank** is the key link for coherent data gathering, on-site inspections and sanctioning (Interviews Flanders February/March 2018). On the one hand, this Flemish authority collects all the necessary data on the livestock, on manure production, usage and transports, and receives all results of the nitrate residue measurements and the MAP measuring network. On the other hand, it has the capacity to inspect farmers and to impose sanctions in case of poor compliance. It has of 150 FTE to control 30.000 farmers and an area of 650.000 hectares (Interviews Flanders February/March 2018). Administration, inspection and sanctioning of farmers are integrated within one organisation. This is seen in Flanders as an effective and generally accepted way of enforcing good agricultural manure practices[9].

The business-oriented approach – nitrate residues measurement

The **measurement of nitrate residues** (*nitraatresiducontroles*) is one monitoring instrument to check compliance with the manure law. Between October 1st and November 15th some farmers are selected by the Manure Bank to measure nitrate residue on one plot of their farm[10] (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015). In 2016 6341 plots were selected for evaluation (Vlaamse Landmaatschappij 2017). If a certain threshold is exceeded, the farmer has to do an **auto-control** on one plot or on farm level one year later. The scale – one plot or farm level – depends on the height of the nitrate residue and the status of the farm as focus or non-focus farm (see section 4.2.3). Whereas the first measurement comes at the cost of the Manure Bank, the auto-control measurements have to be paid by the farmers themselves (Interviews Flanders February/March 2018; for further details about the procedure, see Vlaamse Landmaatschappij 2015, 2017).

The auto-control on farm level results in a categorisation of 0, 1, 2 and 3; the higher the classification, the stricter the sanctions. Category 0 is 'good', the farmer is not confronted with sanctions and its

[9] In contrast, the enforcement of the Integrated Water Decree seems to be more problematic, because the legal responsibilities are distributed among different Flemish authorities: Flanders Environment Agency, provinces and municipalities. They do not have equal capacities to control and enforce compliance. For example, in some provinces there are no or almost no officials that are authorized to issue a summons (Interviews Flanders February/March 2018).

[10] The measurement itself is conducted by an accredited laboratory (Vlaamse Landmaatschappij 2017).

possible status as focus farm by location is lifted, even if the farmer had not applied for it. Categories 1, 2 and 3 represent different gradations, depending on the level of nitrate residues. Farms designated to the most stringent category (category 3) for instance, may have to reduce N usage on the farm with 20% and to cultivate catch crops on 20% of the land, whereas all manure transports, even own manure to own plots, must be conducted by accredited manure transport companies. Farms that do not improve within one year will be classified in a more stringent category or, if already placed in the highest category, be confronted with a fine and enhanced requirements for N usage and catch crop cultivation (Vlaamse Landmaatschappij 2015). With this business-oriented system it is possible that a farm that is not located in a focus area nevertheless becomes a focus farm subjected to more stringent measurements. In the latter case, not location but agricultural manure practices are decisive.

In general, farmer organisations support this system and accept the underlying vision, i.e. to measure and follow up on the impact of the manure practices of individual farmers. However, there is still a debate whether the thresholds are fair and correct, in particular when there is a period of drought (Interviews Flanders February/March 2018).

The business-oriented approach – business evaluation

The second 'stick' is the **business evaluation of individual farms** (*bedrijfsdoorlichting*). In the period 2015-2018 the entire business activities of 3000 companies has and will be thoroughly investigated (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015). Based on the information and data gathered by the Manure Bank – e.g. on manure production, application and transportation, on fertiliser use and on numbers of livestock – it can perform a risk analysis of nutrient losses to the environment of all companies that are related to manure processing, i.e. farmers, but also for instance manure transport companies and manure processing plants. Companies with the **highest risk on nutrient losses** are most likely to be selected for an evaluation. Inspectors from the Manure Bank visit the selected companies, gain insight into the actual business activities and observe what happens on site (paper versus reality). They may discuss possible adjustments to the business operations or, if necessary, impose sanctions or fines (Vlaamse Landmaatschappij 2015). The goal of the programme is to improve local water quality by tracking down 'high risk' companies, ensuring compliance with existing policies and, thus, achieving behavioural change (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2015). In the period January 2016-June 2017 43% of the assessed exploits were faced with fines, or sanctions or had to correct their manure declaration (Vlaamse Landmaatschappij 2018b). To achieve the goal of behavioural change of the assessed companies, in other words, the 'stick' seems to be favourite.

The business-oriented approach – the 'VODKA action'

The third instrument of enforcement is a programme aimed at the 'Responsible handling of animal manure, artificial fertiliser and other fertilisers' (*'Verantwoord Omgaan met Dierlijke mest, Kunstmest en Andere meststoffen',* or VODKA*)*. The 'VODKA action' entails **site visits by inspectors** of the Manure Bank in selected areas, especially those where the MAP measurement points exceed the limit of 50 mg NO3/l. In that sense this is another spatially differentiated policy. Inspections focus on **practices of manure applicatio**n, e.g. the risk of over-fertilisation, manure application on frozen or flooded plots or in buffer zones along the watercourses. If necessary, inspection can be followed by **warnings, advise and/or fines**. The intensified and visible presence of the inspectors in the VODKA areas seems to be

effective: throughout the years there are less infringements of the law recorded in these specific areas (Interviews Flanders February/March 2018; Vlaamse Landmaatschappij 2018b).

Targeted advice

In general, manure policy in Flanders relies to a relatively large extent on regulation and enforcement. Nevertheless, there is also attention for **targeted advice** ('sermons'). Until recently, this task was performed by the state consultancy agency (*Bedrijfsadvies Vlaamse Landmaatschappij*), a part of the Flemish Land Agency. After its abolishment in 2018, the task was largely taken over by a private Coordination Centre aimed at guiding farmers in the field of sustainable fertiliser use (*Coördinatiecentrum Voorlichting en Begeleiding duurzame Bemesting*, CVBB) (Interviews Flanders February/March 2018). CVBB was founded by the farmers' organisations themselves together with, among others, the umbrella organisation of the provinces. It functions largely independently from the Manure Bank, although it gets subsidized by the Flemish government and Flemish officials are advisory members (CVBB 2018). Generally, the abolishment of the state consultancy agency was not regarded as a loss. Due to its links with the Flemish Land Agency and the Manure Bank, farmers tended to associate the agency with inspections, enforcement, sanctions and fines rather than with training and advice (Interviews Flanders February/March 2018). Since the phasing out of the agency, the relationship between farmers and the Flemish authorities has changed: officials nowadays visit farmers only because of the aforementioned inspections and enforcement activities. The CVBB is a more independent organisation perceived by farmers to be focusing on improvement of manure practices (the 'sermon' as such) rather than on detecting violations of the law (Interviews Flanders February/March 2018).

Experiences with subsidies

To finalise the mix of policy instruments, next to 'sticks' and 'sermons', voluntary policy schemes accompanied by subsidies ('carrots') exist. A common subsidy is the **management contract** (*beheersovereenkomst*), part of the European Regional Development Programme. Management contracts used to be popular in Flanders in earlier days, but nowadays farmers are reluctant to make use of the instrument (Interviews Flanders February/March 2018). One argument is that European Directives are not always harmonized. Farmers who are interested in compensation for buffer zones are worried that in their 'green zones' rare vegetation will grow with accompanying consequences related to the EU Habitats Directive. Second, a reform of the programme a few years ago has made conditions for obtaining a contract (on water quality) considerably more stringent. If farmers consider a compensation scheme as impracticable or unrealistic, they will not make use of the subsidy.

4.3.4. Mix of policy instruments – Ireland

Ireland is a good example of a country that mostly puts its money on **carrots and sermons**. There is great emphasis on implementation of programmes of measures of the WFD and the ND through **agri-environmental schemes** financed by the EU Rural Development Programmes. These programmes lead to investments in nutrients storage and improved nutrient utilisation (Department of Housing, Planning, Community and Local Government 2017, p. 14). An example of this is the Green Low Carbon Agri-Environment scheme (GLAS) wherein water protection goes hand in hand with helping rural areas to meet contemporary economic, environmental and social challenges. Priority is given to preserving and enhancing ecosystems related to agriculture and forestry. For 2014-2021 there is a budget of 1.4 million euros and the programme has 38.000 participants. It is mostly about fencing of water courses

and livestock access, low input farming, catch crops, making nutrient management plans and other advise to work on good agricultural practices (Department of Housing, Planning, Community and Local Government 2017, p. 31). Another, slightly older illustration is the Agricultural Catchment Programme, stemming from the Nitrates Action Programme (NAP), that is voluntary for farmers and where good results are booked on reducing N and P since the mid-2000's.

However, despite the many subsidies given to farmers to work on good agricultural practices, and the successes in some areas (including nutrient sensitive, so-called 'red dot' areas', which in Ireland mainly deal with waste water problems in urban areas), there is also quite some reason for concern about the targets of the WFD, as water bodies are deteriorating over the last years. Therefore, there is more emphasis on **both vulnerable and high status areas** ('blue dot' areas) in the second RBMP (Department of Housing, Planning, Community and Local Government 2017, p. 75). The GLAS scheme is continued and hopes to expand to 50.000 farmers, with a strong role of both investments schemes and financial compensation of practices (i.e. carrots) and communication, guidance, knowledge transfers and voluntary adoption of best practices, by convincing farmers that this is the best way to go (i.e. sermons). There are plenty of other examples of this combined approach.

The policies of collaboration, communication and giving financial incentives, moreover, will be continued for the coming years. Collaboration with the agricultural sector and the Department of Agriculture, Food and the Marine (DAFM) is strengthened on a **national** level, by way of both interdepartmental linkages and various working groups, such as the National Dairy Sustainability Forum, the Water Forum and the Water Policy Advisory Committee. It will be strengthened on a **local and regional level**, by way of the LAWCO and the many officers that will 'walk the water ways' (informally known also as 'stream walkers', Interviews Ireland March 2018) to monitor the situation on the ground and the many sustainability advisors, giving advice to farmers on good practices, smart farming and integrated water management. Another example of the strategy of changing farming practices is a programme of 'smart farming' of the Irish Farmers Organisation (Irish Farmers Organisation 2017). Ireland, in other words, puts its cards primarily on behavioural changes of farming practices. The LAWCO tries to stimulate this process by working closely together with local communities and farmers. They try to reconnect the people to the river and making them aware of its benefits (Interviews Ireland March 2018). In this way, it is presumed that the communities rediscover their ownership of the river and appreciate a healthy river. Apparently, a sort of peer pressure may develop following the line of thought 'if they do it, I have to do it', but also a social control or peer control (Interviews Ireland March 2018).

And what about the sticks? With a strong role of the EPA in collecting all relevant data on monitoring of the WFD, close connections (nowadays) with the Department of Agriculture, Food and the Marine, and a strong dependence on national and European funding models, there is the ***potential* of a strong knowledge base** as well as potential to increase **monitoring** and therefore increase the **pressure** on farmers from the top down (Interviews Ireland March 2018). But this is something that is not opted for at this moment. The Irish approach is to **collaborate with the agricultural sector instead of seeking conflict**. The policy makers trust that improving water quality is something that is important for all of Ireland. It is argued that agriculture in Ireland has a **green image** ('Green Fields') and has much to gain in keeping it that way, with pristine areas stabilising and vulnerable areas improved (Interviews Ireland March 2018). If Ireland would become one of many 'polluted' countries in Europe or the world, it

would lose its specific beneficial features on the food market. Next to this, there is the idea that this more soft approach, convincing with help and arguments instead of enforcing, fits the Irish culture and idea of social bonding better (Interviews Ireland March 2018).

4.3.5. Mix of policy instruments – Comparison

There are **remarkable differences** in the way the investigated countries approach the problems with agricultural diffuse pollution and nutrients. This might have to do with the level of environmental pressure within the countries, and perhaps the length of the period dealing with a problematic situation, where Ireland has a less urgent situation and has started with a refreshed approach only lately, while, for example, Flanders has dealt with a highly urgent situation for a long time and elaborated its mix of instruments for over a few decades now. It is interesting to look at these differences and the arguments behind these varying approaches.

	Ireland	***Denmark***	***Lower Saxony / Germany***	***Flanders***
Sticks: regulation with monitoring and enforcement	Potentially strong monitoring data in one hand (EPA) but no strong emphasis at the moment; could potentially lead to a more focused and differentiated approach with stick	At first, great ambitions, stricter regulations, but now relaxation	Monitoring/ coercion. Regulation relatively weak, but might get stronger, development of data synchronisation with obligatory data reporting	Strong emphasis on monitoring/ frequent 'metering' And enforcement, so it seems; data in one hand at the *Vlaamse Mestbank*; combined with focused area –differentiation (focus areas)
Carrots: subsidies, subsidy schemes	Strong emphasis, using EU and national funding for integrated catchment management, rural dev. Plans, agro-environmental schemes., LEADER projects, etc.	Strong on voluntary schemes, compensation measures, e.g. mini-wetlands scheme ('end of pipe')	Regional development Programs (*Agrarumweltmassnah-men*) but uptake limited because voluntary and bureaucratic	Management contracts, rural development programmes (*oeverzones*, erosion) But ' belief ' in it is decreasing…
Sermons: guidance/ communicative instruments	Guidance by state involvement, LAWCO, sustainability advisors, smart farming (market), together with social control and softer approaches (bonding with the river)	Catchment officers funded by EU rural development funds & Food Council (agri. sector)	Guidance together with carrots, but all voluntary. Although consultative service differs in extensiveness (drinking water cooperation very extensive, WFD-areas less extensive)	In former years guidance by state, but shifted to agri-sector (CVBB) – thus separation market and state
SUM:	Potentially an overall strong multiple instruments approach, but generally still soft	Carrots and sermons mostly; arguments: Mandatory schemes would need detailed and reliable data on farm level	No strong emphasis on specific instruments, but all is voluntary; because of urgency heading to using stronger sticks	Strong on integrated data collection in one hand, monitoring, supervision, enforcement in specific areas

Table 4.1 Mixes of instruments: summary of findings

In Table 4.1 we have summarised the findings on mixes of policy instruments. As we have seen in the different countries, a mix of instruments is used to address diffuse nutrient pollution. **Very often carrots are combined with sermons**, but **other combinations are also possible** of course. In all countries there are the basic rules and principles of the WFD and Nitrates Directive (e.g. with roughly the same manure regulation in all countries) but the approach to implementation and pressuring realisation of the goals of the WFD are remarkably different.

Ireland, in the main, has a more 'soft' approach with great emphasis on carrots and sermons. Ireland very intensively relies on EU funding and national funding for integrated catchment management, as we have witnessed with the example of GLAS (section 4.3.4) and co-management and co-responsibilities of local communities, obviously including farmers. With the new approach of the LAWCO (Waters and Communities officers) this discourse connected to implementation of the WFD is strengthened; it is to be summarised as "Working together. Healthy waters supporting vibrant communities" (LAWCO, 2017). Overall this is accepted as being the collective approach in Ireland, although more radical environmental groups warn us for this soft approach, as it is too protective of agriculture that is rapidly expanding; dairy farming is upscaling and becomes more and more intensified (Interviews Ireland March 2018). Nevertheless, the policy makers in Ireland believe in this participatory approach with 'real public participation' as part of developing and implementing measures for river basin management plans.

Also **Denmark**, against a backdrop of a much more antagonistic history of the process of implementing the WFD, emphasizes carrots and sermons. It even went from more coercive mandatory schemes to more voluntary schemes and measures. It invests in solutions as mini-wetlands to find ways of mitigating the consequences of an intensive livestock farming and intensive use of fertilisers. The Danish approach also seeks strong collaboration with the agricultural sector in seeking funding from rural development funds and the Food Council and in seeking local and regional water networks of collaboration. A more coercive approach would possibly be re-introduced when this would not lead to any results.

Lower Saxony shows a mixed picture in emphasizing certain policy instruments. We see the same basic instruments as in other countries, related to the manure regulation and to rural development plans and related schemes and subsidies, and we see a strong role of collaboration and consultation (e.g. drinking water cooperations). Similar to Denmark there was significant opposition by the agricultural sector and therefore a more voluntary approach was chosen. However, in recent years there are a critical remarks on the dominance of carrots and sermons: it would lead to all kinds of bureaucratic procedures and inflexibility for farmers, and the results in terms of progress in soil and water quality are perceived as limited. Moreover, Germany is facing an EU infringement procedure that accelerated the discussions regarding the revision of the Fertiliser Ordinance. In this context, the development of more coercive measures, in combination with more targeted and regionally differentiated programmes is now considered. However, this approach is still criticised as 'weak' by the water and environmental sector and it needs to be seen in how far the adjustments are enough to satisfy the EU.

Flanders, finally, is most clearly moving towards a more coercive approach, combined with strong measuring and monitoring procedures in regionally differentiated areas. With the so-called focus areas and focus farms (about 30% of total agricultural addressees), relating to manure legislation, Flanders has chosen a stricter and more targeted approach to the urgent and low status water quality areas than the other countries in the sample. This will very likely be continued in the next Manure Action Plan. This is possible, in part, because of a strong role of the Flemish Manure Bank which is a governmental agency bringing under one roof comprehensive data on agriculture (farms, but also transport), a good network of monitoring and measurement of nitrates, a (nowadays) strong level of knowledgeable in-the-field inspectors and enforcement (see VODKA action in section 4.3.3) and – not least – a general acceptance of the agricultural policy representatives to have such a differentiated and strict programme for the more polluted/vulnerable areas in Flanders.

To finalize this section on instruments, we may conclude that some countries are seeking more **collaborative ways** of working with softer instruments, while other countries have found ways of developing **more stricter and coercive regimes**, also by collaborating with target groups as agriculture. While some countries have the potential to use more coercive instruments, they deliberately do not choose to do so (Ireland). Lower Saxony and Denmark are currently emphasizing the use of carrots and sermons, however critically considering /re-evaluating the existing approaches. Whether a specific approach will indeed be possible or work out well, is also dependent on how structures are organised and are functioning in the different countries, e.g. are measuring systems, monitoring and enforcement of rules in one hand or fragmented in a policy system, or are agricultural representatives seriously collaborating on water quality issues.

4.4. Key findings

This section summarises the **key findings** from the comparative analysis of WFD and nutrients policies in Denmark, Lower Saxony, Flanders and Ireland. The empirical basis for the brief statements presented under the bullet points below can be found in the respective sections (4.1, 4.2 and 4.3). The findings of chapter 4 provide the basis for the next chapter, in which the relevance and applicability of these potential 'lessons and warnings' for the Dutch context will be assessed.

Key lessons regarding multi-sector cooperative arrangements (see section 4.1)

- Giving stakeholders an **incentive** to participate is an important precondition for successful multi-sector cooperation. These incentives might be quite diverse and could either have a rewarding nature (the 'carrot') or a threatening nature (the 'stick').
- The governance framework for multi-sector cooperative arrangements needs to strike a **balance between firmness and flexibility**. On the one hand, governmental authorities at central level remain accountable towards the EU for the implementation of the WFD. Consequently, a regulatory framework that defines the general goals, tasks and responsibilities and ensures a certain benchmark appears to be necessary. On the other hand, flexibility is important so that regional stakeholders can shape the projects to the area-specific characteristics and can develop a sense of ownership (e.g. clear task combined with freedom on how to implement this task in Denmark in contrast to relatively undefined task and more rigid framework for planning and implementing measures in Lower Saxony).
- It is beneficial to have a knowledgeable **facilitator** that supports the regional cooperation. This role may be fulfilled either by an individual or by an institutional platform. The facilitator may mediate discussions by introducing technical knowledge and having an overview of the local situation, but may also help to build trust between local stakeholders. In addition, the facilitator may have a role in balancing different interests by mediating who has access to the cooperation and who has not.
- Secure and sufficient financing is an important factor as it increases the cooperative arrangements' capability to implement measures. There are different possibilities to generate financial means. One innovative approach may be to make better use of existing national or European funds by introducing a so-called **caretaker**, i.e. a person who (or organisation that) is solely responsible for setting up projects to implement the WFD and has the capacity to deal with the bureaucratic requirements that arise when applying for these funds (e.g. Germany). The role of facilitator and that of caretaker could possibly be combined.

Key lessons regarding regionalisation and differentiation of policies (see section 4.2)

- Spatial and regional differentiation of WFD and nutrients policies takes many different forms. As far as the policy goals are concerned, differentiation can either be focused on establishing stricter measures in **highly polluted areas**, e.g. for reasons of cost-effectiveness and/or to comply with EU requirements ('focus areas', 'hotspots', e.g. Denmark, Germany, Flanders), or on providing special protection for **relatively 'clean' areas** in order to prevent deterioration from the outset or to acts as 'show cases' of the successful implementation of relevant EU directives ('low-hanging fruit', e.g. Germany, Flanders, Ireland).
- As regards instrumentation, spatial differentiation of WFD and nutrients policies takes place on a **mandatory** basis (the 'stick', e.g. Flanders) or on a *voluntary* basis, in the latter case typically accompanied by financial **compensation** (the 'sermon' and the 'carrot', e.g. Denmark) .
- Spatial differentiation of WFD and nutrients policies requires the availability of detailed and geographically specific **data** that are broadly regarded as reliable and trustworthy (e.g. Flanders). If key stakeholders do not regard the data as reliable and trustworthy the risk of a 'data trap' arises (e.g. Denmark). In this situation, the justification of measures aiming at differentiation is continuously questioned, leading to the demand for (even) more data, possibly litigation, and postponement or cancellation of policies. Data problems are likely to become particularly pressing if differentiation takes place on a mandatory basis.
- As the spatial differentiation of WFD and nutrients policies implies the differentiated treatment of polluters, particularly farmers, the acceptance such differentiation strongly depends on how **questions of equality and inequality** are dealt with. Questions of equality, or creating and maintaining a level playing field, are politically and morally highly sensitive issues, the approach of which tends to be deeply embedded in a country's political culture and organisation and for which boundaries are set by EU competition rules and harmonised regulation. Moreover, controversies around (in)equality and data problems (see previous point) may reinforce each other.

Key lessons regarding the mix of instruments (see section 4.3)

- All countries use mixes of instruments, but some countries are seeking relatively more **collaborative** ways of working with softer instruments, foremostly combining 'carrots' and 'sermons' (e.g. Ireland), while other countries tend to developing relatively stricter and more **coercive** regimes based on measurement, monitoring and enforcement (i.e. the 'stick', e.g. Flanders). Among the countries studied in this report, Denmark and Lower Saxony occupy a position in the middle of the spectrum by applying **mixes of partly mandatory and partly voluntary instruments** in generally collaborative arrangements.
- While some countries might have the potential to use more coercive instruments, they deliberately do not choose to do so (e.g. Ireland). Elsewhere, the current mixed approaches are being critically considered and re-evaluated, while openly discussing the option to shift to stricter regimes in the future (e.g. Lower Saxony and Denmark). A crucial argument in the dilemma between applying a more collaborative vs. a more coercive approach relates to **legitimacy**. While using softer instruments helps to create legitimacy and to secure cooperation with stakeholders, more coercive methods run the risk of jeopardising legitimacy and cooperation, potentially leading to antagonistic relations between regulator and regulated. Flanders gives an example of creating a more coercive regime while maintaining the necessary collaboration with the agricultural sector through a very focused approach with a good knowledge base.

- Agri-environmental schemes and programmes with **financial incentives** are in use across the board: despite recurrent complains about the bureaucratic burden involved in using these schemes and programmes, all countries in the sample seek to strengthen and implement national policy goals with the help of European funding. However, in some countries there are doubts about the long term effectiveness of these programmes (e.g. Flanders, Germany), while in other countries these programmes are considered as important for providing additional resources, incentives and opportunities to stakeholders, particularly farmers, as well as in light of long-term education aimed at stimulating change of practices within agriculture (e.g. notably Ireland, also Denmark).
- In some countries, there is a gradual shift of 'sermons', i.e. guidance, information and communication, **from public to private** means, for instance by increasingly leaving the task of consulting farmers in relation to water issue to private organisations (notably Flanders).

5. Conclusion: Key themes and scenarios for the Netherlands

The final chapter of this report will connect our findings from four selected countries – Denmark, Germany (Lower Saxony), Belgium (Flanders) and Ireland – to the Dutch situation. The previous chapter was structured around three key themes related to the implementation of the WFD and nutrients policy:

1. multi-sector cooperative stakeholder arrangements
2. spatial differentiation of policies and measures
3. the mix of policy instruments to address diffuse nutrient pollution from agriculture

We will now consider in some detail the implications of the findings around these themes for the further development of WFD policies in the Netherlands (section 5.1.3). Focusing each theme separately should be seen primarily as a 'thought experiment'. In reality, of course, no country would put all its cards on multi-sector cooperation or differentiation alone. Policies are always mixes of various approaches and instruments. This is why, in a final section (5.4), we develop four tentative scenario's for future WFD and nutrients policy in the Netherlands based on different combinations of the themes.

The present chapter draws, first, upon the findings of the comparative study presented in chapter 4. It should be emphasized once again that countries differ in many respects, e.g. with regard to the type and character of the problems at stake, the existing policies in the field, the physical and economic circumstances and the political, legal and institutional context. Therefore, foreign experiences and 'best practices' can never be transferred directly. They can, however, provide food for thought when considering the adjustment or revision of current policies and the institutional conditions necessary for such adjustment or revision. This is what we aim at in the following sections. Second, the present chapter makes use of the discussions during the concluding project workshop held on 12 April 2018 in Nijmegen (see chapter 3).

5.1. Theme 1: Multi-sector stakeholder cooperation

In this section, based on the findings of chapter 4 (particularly section 4.1), we explore the possibility of creating more regional discretion in regulatory ties and giving a mandate to groups of stakeholders to initiate and set up projects to achieve the goals of the Water Framework Directive. This would be in the spirit of the WFD as its design and application have always put great emphasis on public participation, especially in Article 14 which prescribes forms of public participation (Koontz, T.M. & Newig, J. 2014; Graversgaard, M., Jacobsen, B.H., Kjeldsen, C. & Dalgaard, T. 2017, see also section 4.1).

In a **'regional discretion' -variant**, such cooperative arrangements would be established at the local or sub-basin level. Following Ostrom's concept of **polycentricity** (Ostrom 2010; for a recent overview of theoretical discussion on the concept, see Jordan et al. 2018), such arrangements should have considerable independence – although necessarily within the boundaries set by the relevant EU directives – to develop and implement their own responses. This way, **local knowledge** is used for addressing local problems and stakeholders are challenged to come up with innovative solutions and to **establish synergies** that go beyond the mere objectives of the WFD. Legally, the arrangements could lead to contracts or covenants between local stakeholders. As policies are jointly developed and

implemented, **acceptance** and **commitment** are likely to be higher than in the case of traditional regulation 'from above'. Ultimately, and possibly facilitated by regional or national governmental officials, innovations and 'best practices' could travel from one local context to another through learning processes. However, as Member States remain legally accountable to the EU for compliance with the Directive, locally divergent policies (measures, monitoring, reporting etc.) may lead to problems of accountability.

In a variant of 'national guidance of regional differentiation', higher level authorities set the framework for local or regional cooperation, for instance by formulating a **specific task** and/or formulating **preconditions**, for instance of a legal or financial kind, and/or by providing a preselected list of possible measures. This would give the region less discretion in designing these measures, but the framework would give the regional stakeholders (for example local farmers) certain c**hoice options**. This approach could still lead to formalisation in local or regional contracts, but within a centralised regulatory framework covering goals as well as – to a smaller or larger extent – means and enforcement. In this variant acceptance and commitment is expected to be higher than in a case where there is much less room for regional input and policies are fully created nationally (see section 5.4, particularly scenario 4).

All four countries covered in this research project showed one or more sorts of regional multi-sector stakeholder cooperation (see section 4.1). However, none of them gave full freedom to those cooperations to develop and implement their own policies. In most cases, local or regional arrangements were provided with more or less clear tasks and/or catalogues of measures, i.e. in line with the 'national guidance' variant just described. There are two distinct reasons for this. First, as pointed out, national governments remain **accountable** for complying with the WFD and other EU directives, most prominently the Nitrates Directive. They thus have a strong interest in ensuring that the goals and requirements set by those directives are met throughout the country. Second, experience in all four countries suggests that setting a framework of tasks and incentives 'from above' is important for achieving and maintaining **momentum** in the local or regional process. Evidence abounds that task assignments should be clear, framed in terms of benefits rather than costs and practically 'doable' in order not to lead to unproductive antagonism between stakeholders. For example, regional stakeholder processes about hydro-morphological issues tend to be more successful than those about more controversial issues such as the reduction of nutrients loads (e.g. Denmark, Lower Saxony). Incentives may range from visible benefits, e.g. cost reduction, or financial compensation to providing assistance, for instance through facilitators who help to shape the process (Denmark, Lower Saxony, Ireland), 'caretakers' who support administrative tasks (including the application for EU funding which is often experienced as bureaucratic and tedious) (Lower Saxony, Flanders), or individual consultation available to farmers (Denmark, Lower Saxony). Importantly, the incentive may also take the form of a threat to impose measures through regulation if the cooperation fails (Denmark, Lower Saxony).

The advantages of a 'regional discretion'approach to regional cooperative arrangements, in sum, are the degree of acceptance of measures, the use of local knowledge and the commitment of local stakeholders to the agreed policy programmes. The disadvantages of this approach relate to accountability and possibly also effectiveness; it probably is very difficult to book sufficient results in a process of self-disciplining and self-governance of local stakeholders which is only facilitated by

national stakeholders. The 'national guidance' approach to cooperative arrangements, in contrast, may create clear structures, aims and tasks while still leaving room for regional choices; this will probably increase efficiency and effectiveness while retaining local commitment to measures. Concluding this section, we will briefly review three different initiatives for multi-sector cooperation in the Netherlands. The first two initiatives come close to the 'national guidance of regional differentation' variant, while the third is more resembling a ''regional discretion' -approach.

First, the 'Delta Approach Water Quality and Fresh Water' (*Delta-aanpak Waterkwaliteit en Zoetwater*, DAWZ[11]) brings together a wide range of stakeholders (including, among others, three ministries, regional authorities, water boards, drinking water companies, farmers' organisations and nature organisations). The DAWZ is primarily aimed at supporting efforts to improve water quality in the Netherlands through knowledge and coordination. Although regional activities are developed under the DAWZ, e.g. in the form of area-specific pilot projects (*gebiedspilots*), its efforts are to a large extent centrally steered. This approach might be strengthened when the local DAWZ stakeholder groups would be given a clear objective for their area including an accompanying budget under the supervision of the competent water authority.

Second, in 40 drinking water areas currently having low water quality, stakeholders are given the opportunity to pick their own measures from a predetermined list of 'proven' measures and to add supplementary ones. The result has to be laid down in an area-specific implementation agreement. If this agreement is not concluded before 1 April 2019 or if the measures are considered insufficient, the 'stick' of formal regulation will be used (Ministerie LNV/Ministerie I&W 2017). However, this arrangement only applies to a minority of all drinking water areas, and thus to a limited and specific share of the Dutch surface only. This approach may be comparable with the Lower Saxon drinking water cooperations, and could be strengthened with an intensive farm-based consultation.

Third, already since the early phases of WFD implementation (Uitenboogaart et al. 2009), Dutch water boards have developed various initiatives for stakeholder involvement around local projects. This was already the case with the area-specific preparations of the WFD (*gebiedsprocessen*). These local stakeholder processes may take various forms – but results are often highly dependent on the distribution of property rights and the availability of financial resources. Moreover, existing regulation tends to act as barrier, vested interests tend to be confirmed (Behagel 2012), and 'upscaling' to other areas turns out difficult, not least in view of the costs involved (e.g. Santbergen 2013). In the absence of a 'stick behind the door' these processes might take very long. Inspired by Ireland, furthermore, wide consultation meetings may help to strengthen local awareness, motivation and societal peer pressure among farmers and other water users.

5.2. Theme 2: Spatial differentiation of policies and measures

The theme of **spatial differentiation** of WFD and nutrients policies entails the use of policies and measures that are locally or regionally adjusted. This implies that a farmer – or other polluters, for that

[11] See: https://www.rijksoverheid.nl/documenten/rapporten/2016/11/07/intentieverklaring-delta-aanpak-waterkwaliteit-en-zoetwater-tussen-overheden-maatschappelijke-organisaties-en-kennisinstituten (last visited 16 April 2018).

matter – in one location may be confronted with different policies and measures than his or her colleague in another location.

In relation to regional differentiation, three features of differentiation need to be considered: what is the goal of the differentiation, what is the basis for differentiation and with which instruments can the differentiation be implemented.

The first feature entails the **goal of differentiation**, i.e. improving highly polluted areas or protecting less polluted areas. Pursuing stricter policies in ***highly polluted areas*** can be translated as 'doing more where it is necessary and doing less where it is not necessary' and will, in theory, raise the cost-effectiveness of measures, although of course the risk of shifting problems to less polluted areas should be avoided. Introducing stricter measures in ***relatively 'clean' areas*** can be done either to maintain the existing good status or to act as 'show cases' for successful implementation – or both at the same time. Differentiation aimed at highly polluted areas and differentiation aimed at less polluted areas exist in parallel in most of our case study countries (see section 4.2).
Second, the **basis of differentiation**[12] is another feature to define differentiation. On the one hand, differentiation can be based on the ***input*** of pollutants into the ecosystem. This is the current basis of nutrients regulation under the Nitrates Directive in most countries, including the Netherlands, where maximum application rates for fertiliser are calculated with reference to crop types and soil types, among other things. On the other hand, differentiation can be based on actual status of ***environmental quality***. This requires intensive monitoring of the 'throughput' of nutrients into surface and/or ground water. The quality of surface water and ground water as measured by an intensive monitoring network is the basis of the designation of focus areas in Flanders (see section 4.2.3). In Lower Saxony, the designation of areas for differentiation under the new Manure Regulation is likely to take place at least partly on basis ecological parameters (see section 4.2.2). Also in Denmark, the vulnerability of particular surface and coastal waters played a role in the attempt to establish cultivation-free riparian zones under the 2011 Buffer Zone Act and in designating areas where the cultivation of catch crops is currently stimulated (see section 4.2.1).

The third feature relates to **instrumentation**: differentiation can be implemented either on a ***mandatory*** or on a ***voluntary*** basis. Differentiated application rates for fertiliser (see above) follow from the Nitrates Directive and are generally mandatory. With regard to additional measures, however, considerable differences between the countries in our sample can be observed. Whereas the system of focus areas in Flanders has a strongly mandatory character, the differentiated measures currently in force notably in Denmark are largely voluntary (see section 4.2). In Flanders, moreover, focus areas are also subjected to a stronger enforcement regime (see section 4.2.3).

However, the experience from the countries in our sample shows that differentiation does not come without its problems. Consequently two **warnings** need to be issued. In the first place, differentiation requires a **large amount of detailed, geographically specific data**. Depending on the basis chosen for differentiation, this involves data regarding the input of pollutants or data on environmental quality. Collection and/or calculation of both types of data is complicated and costly. On the one hand, these

[12] See also Keessen et al. 2011, who distinguish four options for differentiation of nitrate requirements from a legal point of view.

data are needed as a basis for designing and justifying differentiated measures. On the other hand, the implementation of differentiated measures requires precise monitoring to assess their effectiveness and to allow for adequate enforcement. What matters here is not only the quality of the data as such, but particularly also the extent to which they are perceived as reliable and trustworthy. The case of Denmark showed that doubts among stakeholders about the reliability of data may lead to political controversies and Court cases – and to the subsequent production of even more data, which may again be called into question. The eventual result of the process was characterised earlier as a '**data trap**'. Also in Lower Saxony, current efforts to establish more differentiated policies may well give rise to data problems. The broad acceptance of mandatory differentiation and the remarkable avoidance of a 'data trap' in Flanders can be related to the circumstance that an exceptionally dense monitoring system had been set up already in the 1990s. It had acquired a firm and trusted status in the 2010s, when the system of focus area and focus farms was established (see section 4.2).

In the second place, differentiation raises more fundamental issues about **equal treatment**, or – in more economic terms – the maintenance of a level playing field. Questions of data and equality may in fact reinforce each other and particularly so when mandatory differentiation is at stake. It must be noted here that compensation payments intended to re-establish the level playing field are possible (and in fact broadly used, e.g. in Denmark, see section 4.2.1) as long as differentiation takes place on a voluntary basis. Compensation of mandatory differentiation is difficult in view of the principle of cost recovery laid down in Article 9 of the WFD.

5.3. Theme 3: The mix of policy instruments to address diffuse nutrient pollution from agriculture

WFD and nutrients policies – and in fact government policies generally – almost always and everywhere consist of *mixes* of instruments. The crucial question is the exact composition of the mix – or in the terms used in this report: the balance between coercive or mandatory measures ('sticks'), incentives ('carrots') and communicative and consultative measures ('sermons').

Among the countries in our sample and focusing on nutrients, as we have a seen, Flanders with its focus areas combined with intensive monitoring and enforcement is most strongly leaning towards a coercive approach. Following the threat of an EU infringement procedure and the adoption of the new federal Manure Regulation, Lower Saxony also seems to be slowly moving in that direction, although it remains to be seen how far this shift will really go. In Denmark, the balance has shifted back and forth over time. Currently, a combination of carrots and sermons prevails, but sticks may return after 2019/2020. Carrots and sermons on a voluntary basis (still) dominate in Ireland – although it is said that social pressure (as a coercive power) and support of the general good of clean water, as an economic incentive, plays a more important role here.

Considering the fact that nutrient problems are unevenly spread over the country, one option for the Netherlands would be to go the way of **stronger spatial differentiation of policies in combination with specific mixes of instruments**. This option can be positioned within the 'national guidance' -approach described above (section 5.1). In Flanders, this takes form in **having stricter monitoring and enforcement regimes** for the combined implementation of manure regulation and WFD policies in focus areas. More generally stated, mixes of instruments may **reinforce** each other: sticks come to play a role at the background of carrots and sermons – or, alternatively, more guidance becomes part of a

package with regulation and subsidies. While combining guidance of farmers and (EU) subsidies is very common in almost all countries, for instance in the form of voluntary programmes for cultivating catch crops, establishing buffer zones or constructing mini-wetlands combined with compensation payments, it must be kept in mind that such carrot-and-sermons schemes could be part of a **sequence** of instruments. The effectiveness of carrot-and-sermon schemes could be enhanced by keeping the stick of *future* regulation behind the door (cf. the Danish mini-wetlands programme). Or, one could opt for a regime where a set of *new measures* first becomes part of area-specific policies voluntarily; after they have been accepted by stakeholders and proven to be effective and efficient, they may become mandatory.

The alternative option would be to **leave the exact measures to the multi-sector stakeholder cooperation(s)**, i.e. a policy model which comes closer to the 'regional discretion' -approach described earlier (section 5.1). This could take place at a local and/or regional scale, particularly of course in those areas where nutrient problems are most pressing, but, as observed, there are limits to this (see above, sections 4.1 and 5.1). This option is expected to lead to more voluntary mixes of instruments and measures, most likely with financial incentives and communicative instruments, possibly even forms of crowd funding among local communities. Given the seriousness of the problems in some areas in the Netherlands, however, enhanced differentiation on a purely *voluntary* basis (the carrot and the sermon) would not be likely to lead to sufficient results. However, if voluntary differentiation were to be followed by the re-introduction of 'mild', but nevertheless *mandatory* 'top-down' elements (i.e. the stick, e.g. formal consolidation of locally reached solutions, imposition of additional measures in areas where locally agreed solution turned out insufficient, mandatory diffusion of local 'best practices' etc.), the dilemma of unequal treatment would present itself with particular force and lead to justified questions of social acceptability.

The present section, finally, offers room for some considerations on combining sticks, carrots and sermons at a more practical or normative level:

- Combining sticks (i.e. regulation) and carrots (financial compensation) *simultaneously* could in theory be an attractive way of alleviating the economic and social consequences of more stringent measures, but are difficult to reconcile with the Polluter Pays Principle and the principle of cost recovery stipulated in Article 9 of the WFD. One the one hand, we must be careful that the mix of measures does not lead to a situation where the polluters get payed. On the other hand, this should not pre-empt creative thinking about new financial arrangements, for instance based on joint investments at local or regional level.
- '*Negative* carrots', i.e. *levies* or *taxes* rather than compensation payments, have so far not been widely applied in nutrients policies, neither in the Netherlands nor in any of the other countries in our sample. As adjacent policy fields have shown, however, such levies can be very effective, especially if the revenues are steered back to the sector, e.g. for financing research and other investments supporting the development and implementation of innovative solutions for the problem at stake, e.g. extending the monitoring system or stimulating 'good' farming practices. A key example of a successful 'earmarked tax' is provided by the levies that have been imposed on point source under the Dutch Surface Water Act (*Wet Verontreiniging Oppervlaktewater*) since the early 1970s (Andersen 1994).

5.4. Institutional conditions of - and collaboration within - four scenarios

On the basis of the themes that have been elaborated in this report and in the previous sections of this chapter, we have created four different scenarios for future stages of development of the WFD implementation in The Netherlands. The scenarios have been constructed by combining the two basic choices underlying the second and the third of the key themes of this report, i.e. regional differentiation (yes/no) and the core direction in modes of governance (voluntary or coercive). Combining the two choices leads to four (2x2) scenarios. Within this context, we want to elaborate the core institutional conditions and the role of stakeholders and collaboration – i.e. the first key theme discussed in these report – prevailing in these four scenarios. The scenarios are *ideal types* of possible approaches and obviously could be amended and – to a certain extent - be combined. We have put emphasis on the problems related to agriculture and water quality. We briefly introduce the basic elements of the four scenarios below. The scenarios are presented in more detail in table 5.1.

Scenario 1. Regional differentiation on a voluntary basis

In the Netherlands, differentiation is currently mostly limited to mandatory, input-based application rates for fertilisers, like in many other countries. These are, as mentioned, differentiated according to soil type and crop type. In addition to that, differentiated measures may be established in a limited number of drinking water areas currently having low water quality. Under the scenario of strengthening the role of spatial differentiation, the Netherlands would develop a broader range of differentiated measures, for instance relating to the method and timing of applying manure to the land, the cultivation of catch crops or the establishment of buffer zones. In this scenario we translate spatial differentiation into **regional differentiation** and propose a differentiation among regions on the basis of voluntary agreements among stakeholders. 'Voluntary' in this context does not mean 'uncommitted'; local stakeholders in this scenario voluntarily commit themselves to mutual obligations. This includes **various kinds of multi-sector stakeholder cooperation** in the Netherlands (see section 5.1) that could be extended and/or more broadly used. In order to prepare this scenario, the successes and failures of both small-scale projects set up by regional water authorities and agreements in drinking water areas should be systematically evaluated, lesson-drawing from these projects should be stimulated, and application of successful models to more and other areas should be considered. Moreover, assuming that the agreed measures are sufficient to comply with the relevant EU directives, mechanisms must nevertheless be set up to ensure that central government can fulfil its obligations in terms of monitoring and reporting to 'Brussels'. After all, Member States remain accountable to the EU.

Scenario 2. A nation-wide approach on a voluntary basis

Considering the size of the problem and its far-reaching implications for the entire agricultural sector in the Netherlands, the suggestion of a comprehensive, **nation-wide agreement on the future of Dutch agriculture**, leading to a high degree of self-commitment and following the model of the Energy Agreement, should be repeated here. This could be linked to the current Delta Approach Water Quality and Fresh Water (DAWZ), but could also be set up in a broader coalition.

This scenario is inspired, among others, by the Irish national broad collaboration of the Ministry of Agriculture and the Ministry of Housing and many societal parties (Water Forum and Water Policy Advisory Committee) (see section 4.1.4). An encompassing, fairly centralised approach to stakeholder involvement fits into a long macro-corporatist tradition of broad agreements between major social

partners in the Netherlands, ranging from the 1982 'Wassenaar Agreement' on wages and unemployment (Visser & Hemerijck 1997) to the 2013 Energy Agreement[13] and the current Dutch 'climate tables' to practically implement the Paris Agreement. The DAWZ could be perceived as a predecessor of a comprehensive, nation-wide agreement on the future of Dutch agriculture. The idea of a nation-wide agreement on agriculture was recently promoted also by Hans Mommaas, Director of PBL (NRC-Handelsblad, 20 September 2017), and by Wiebe Draijer, former president of the Social and Economic Council (Sociaal-Economische Raad, SER), in that capacity chairing the process of the Energy Agreement, and currently CEO of Rabobank, the leading bank in the Dutch agricultural sector (NRC-Handelsblad, 17 November 2017). This scenario suggests a strong role for the national level in directing broad collaboration on sustainable agriculture in light of environmental issues and water quality, which, in turn, could create windows of opportunity to intensify regional multi-sector cooperation.

Scenario 3. Regional differentiation on a formalised, coercive basis

In the Netherlands, policies regarding diffuse pollution from agriculture and particularly nutrients already show a core of coercive measures in the form of application norms for nitrate and phosphate under the Nitrates Directive. Around this core, there is a large and complex system of detailed additional measures dealing with, for instance, the timing of manure application to the land under specific circumstances, processing and transport of manure, catch crops etc. Many of those measures also have a coercive character and are revised and adjusted regularly, notably in the context of the periodical action programmes required under the Nitrates Directive (latest edition: Ministerie LNV/Ministerie I&W 2017). Nevertheless, the nutrients load in the Netherlands, particularly in regions with sandy soils where intensive livestock farming is concentrated, remains high (Ministerie LNV/Ministerie I&W 2017, ch. 4). In a recent special of the Dutch newspaper NRC-Handelsblad (7 April 2018) Hans van Grinsven, senior researcher at PBL, came to the conclusion that particularly in these regions, current nutrient policy seems to have reached its limit. This scenario starts from the conclusion that the current general nation-wide approach, especially with regard to diffuse pollution from agriculture is not sufficient to reach the goals of the WFD. A **regionally differentiated approach** is required and this will not be generated voluntarily, so **formal and binding measures** should be taken to differentiate areas, in the Netherlands, especially the areas that are problematic in terms of phosphates and nitrates need to receive a focused approach (resembling the focus areas and focus farms in Flanders, section 4.2.3). On the one hand, this approach may lead to intensified discussions on equity and on the quality of monitoring, with the possible risk of a 'data trap', as it occurred in Denmark (see sections 4.2.1 and 4.2.5). On the other hand, a regionally differentiated approach seems relatively accepted and successful in Flanders (see section 4.2.3). In order to alleviate the data trap and the equity problem, and following the example of Flanders, the differentiation should be developed in close cooperation with representatives of the agricultural sector. By ensuring a fair and inclusive decision-making process the differences in spatial differentiation might be accepted among the stakeholders. Even then, however, it may be expected to be difficult in the Dutch context to create regional differentiation entailing intensified and/or additional measures in vulnerable areas in the south and east of the country. Fierce opposition may be expected especially from the agricultural sector.

[13] See https://www.energieakkoordser.nl/ (last visited 16 April 2018).

Scenario 4. A nation-wide approach on a more coercive basis

The last scenario relies heavily on new regulation with regard to water and diffuse pollution of agriculture. It starts from the position that a more effective approach is necessary but that both regional differentiation and voluntary agreements with the relevant sectors are very difficult to realize. This leaves one option open: a more coercive nation-wide approach to water and agriculture, consisting of a new formal national regime and stricter measures for fertilizer management, stricter application standards, less intensive agriculture, stricter zoning systems etc., in order to finally reach the overall goals of the Water Framework Directive. This will require a strong political will to convince society of the necessity of such overall regime.

Finally, choosing between the sketched options is foremost a political responsibility. We have tried to give inspiration by looking beyond the Dutch border, trying to create something like an outsider view and thus to reconsider the current Dutch approach to the WFD. This will hopefully help to find effective solutions in the next stages of implementing the Water Framework Directive, in close connection to nutrients policies. Issues of water quality increasingly set strict boundaries to the development of agriculture in Europe. Or as one Irish interviewee commented to us: 'Water quality is the new milk quota'. We need to find ways to unite agricultural goals and water related values. The importance of water for the Netherlands, also in light of a climate-robust water quality provision, is beyond dispute.

Table 5.1: Four basic scenario's to explore directions for the Netherlands, based on regional differentiation (yes/no), and a voluntary or coercive character. Source: table summarises findings, and draws from references mentioned in the previous sections.

Four basic scenario's	**Institutional conditions (structures of arrangements)**	**Stakeholders and collaboration**	**Practical examples**
1. Regional differentiation on a voluntary basis Focused, differentiated, regional collaborative arrangements	In general: Be clear about the basis of differentiation. This scenario requires specific communication, rules and incentives (resources) to create voluntarily support (see below). Discourse: A discourse of collaboration and perceived necessity to differentiate among regions. Rules: Procedures for process management to maintain voluntary support, to monitor effectiveness and to warrant EU compliance. Resources: - Importance of local knowledge and innovation strategies - European co-funding for regions should be facilitated. - Create incentives for pro-active regions.	Regional legitimisation from provinces, regional water authorities, municipalities... …with cooperation of and between Ministries. Cooperation of representative organisations (LTO, environmental and nature conservation NGO's, UvW). Emphasise ways of regional 'bonding'. Intensified assistance and guidance for stakeholders. Build on social pressure to comply.	From a 'regional discretion'-perspective: contracts or covenants between regional and/or local stakeholders From a ' 'national guidance' -perspective: specific tasks, formulated preconditions, preselected list of measures as choice options; might take the form of area-specific implementation agreements. Make use of facilitators. Make use of caretakers who support administrative tasks.
2. Undifferentiated, nation-wide approach on a voluntary basis Nation-wide collaborative arrangement	In general: With regard to the WFD: nation-wide approach already largely in place in the Netherlands. But a nation-wide agreement on the future of Dutch agriculture would create opportunities for improving the situation on diffuse pollution of agriculture. Discourse: - Strong discourse of overall collaboration and perceived necessity of a nation-wide approach. - National cooperation on basis of a new long-term agreement on water and agriculture should consider the problems of agriculture, environment, climate and water in a broad and integrated perspective. - Requires clear points on the horizon/clear goals/mission statement on the long term. Rules and Resources: - New national agreement/covenant relating to agriculture and water. - Financial means to support implementation of the new agreement.	Cooperation of representative organisations (LTO, environmental and nature conservation NGO's, UvW). Strong cooperation between Ministries. Intensified assistance and guidance for stakeholders. Build on social pressure to comply.	The model of the Energy Agreement could bring inspiration for a new policy. This might be part of the new DAWZ: Delta-Approach Water Quality and Fresh Water. Ireland gives the example of a comprehensive approach: a nation-wide discourse and agreement on co-responsibility for water quality with farmers, communities and other stakeholders; with support of Water Forum and National Water Committee.

3. Regional differentiation on a formalised, coercive basis Focus areas with formalised regimes on the basis of WFD and Nitrates Directive with strong enforcement and monitoring	In general: Be absolutely clear about the formal basis of differentiation: this scenario requires formalised rules and procedures to legitimise regional differentiation. Discourse: This requires a discourse of both collaboration and perceived necessity to differentiate among regions. Rules and Resources: - Procedures for formal, legitimate and effective management of precise monitoring and enforcement (including EU compliance). - Strong data management in specific regions – monitoring ND and WFD.	Strong collaboration between WFD and ND based on monitoring and enforcement systems. Strong collaboration between water authorities, provinces and enforcement agencies related to agriculture (NVWA, etc.). Legitimation of regional differentiation on a formalised, coercive basis also requires regional legitimisation, from provinces, regional water authorities, municipalities, …with cooperation between Ministries. And requires to be 'backed up' by representative organisations, e.g. LTO and regional stakeholders.	Create or enhance precise and trusted monitoring systems as a basis for effectivity and adequate enforcement. Collaborative efforts in enforcement.
4. Undifferentiated, nation-wide approach on a more coercive basis	In general: With regard to the WFD: nation-wide approach already largely in place in the Netherlands. This scenario would, however, entail a 'leap forward' on a formal basis – an enhanced formal regime for agriculture and water... Discourse: - Strong discourse of necessity of a stricter nation-wide approach to tackle problems with the WFD, ND and other issues. - Clear points on the horizon laid down in formalised goals. Rules and resources: - Stricter regime for all involved in implementing the WFD and ND. - Discussion on volume of intensive agriculture and practices of intensive fertilise management. - Stricter application standards for manure; stricter time schedules for application, stricter zoning systems, etc. - Financial means to support implementation of the new regime.	Strong role of politics and political actors to confront the society with the problem of implementing the WFD and ND. Formally creating co-responsibility for clean water bodies, etc.	The recent development in the energy transition in the Netherlands is an example of a relatively radical nationally guided societal transition. Enhanced, politically sanctioned and legally binding regime on water and agriculture, implemented through e.g. a national '*Bestuursakkoord Water en Landbouw*'.

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Annexes

Annex 1: List of national experts
Annex 2: Participants workshop 1 – Utrecht, 21 November 2017
Annex 3: List of interview respondents
Annex 4: Participants workshop 2 – Nijmegen, 12 April 2018

Annex 1: List of national experts

- Denmark: dr. Helle Ørsted Nielsen
  Helle Ørsted Nielsen is a senior researcher at the Department of Environmental Science at Aarhus University. She is a reputed expert in the field of environment and agriculture with a focus on water issues.

- Germany/Lower Saxony: prof.dr. Jens Newig
  Jens Newig holds the Chair of Governance and Sustainability at Leuphana University Lüneburg. He is one of the leading experts in the field of water governance in Germany and from a comparative perspective and has published widely on this issue.

- Belgium/Flanders: dr. Ann Crabbé
  Ann Crabbé is a senior researcher and member of the research group Environment & Society of the University of Antwerp. River basin management and integrated water policy was the subject of her PhD dissertation (2008). She has focused on these issues ever since.

- Ireland: dr. Brendan Flynn
  Brendan Flynn is a Lecturer at the Department of Political Science and Sociology of National University of Ireland, Galway. He is one of Ireland's key specialists on the implementation of EU environmental law with a focus on policies related to agriculture and fisheries.

Annex 2: Participants workshop 1 – Utrecht, 21 November 2017

Name	*Organisation*
Michaël Bentvelsen	Unie van Waterschappen
Noud Kuijpers	Projectbureau KRW-DHZ Maasregio
Harrie Menning	Waterschap Aa en Maas
Duncan Liefferink	Radboud University Nijmegen
Maria Kaufmann	Radboud University Nijmegen
Nanda Kurstjens	Radboud University Nijmegen
Mark Wiering	Radboud University Nijmegen

Annex 3: List of interview respondents

Time	*Name*	*Organisation*
Denmark		
February 2018	Niels Philipp Jensen	Kommunernes Landsforening (Local Government Denmark), Copenhagen
February 2018	Erik Jørgensen	Landbrug og Fødevarer (Danish Agriculture and Food Council), Copenhagen
February 2018	Henning Mørk Jørgensen and Lisbeth Ogstrup	Danmarks Naturfredningsforening (Danish Nature), Copenhagen
February 2018	Christian Vind, Peter Østergaard Have and Kirsten Flemming	Miljø- og Fødevareministeriet (Ministry of Environment and Food of Denmark), Copenhagen
Germany/Lower Saxony		
February 2018	Hermann Hebbelmann	Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz, NLWKN, Meppen office
February 2018	Godehard Hennies	Wasserverbandstag Bremen/Niedersachsen/Sachsen-Anhalt, Hannover
February 2018	Heide Jekel	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, Bonn
February 2018	Alice Martens, Katrin Flasche and Fabian Wolff	Kommunale Umwelt-Aktion; Niedersächsischer Städte- und Gemeindebund, Hannover
March 2018*	Elke Meier	NABU Niedersachsen e.V., Fachbereichsleitung Naturschutz
February 2018	Kay Nitsche and Renate Thole	Niedersächsisches Ministerium für Umwelt, Energie, Bauen und Klimaschutz, Hannover
February 2018	Onno Seitz and Beate Thomann	Landwirtschaftskammer, Oldenburg
Belgium/Flanders		
February 2018	Dirk Coomans	Coördinatiecentrum Voorlichting en Begeleiding duurzame Bemesting (CVBB), Sint-Katelijne-Waver
February 2018	dr. Ann Crabbé	Universiteit Antwerpen, Antwerpen
February 2018	Ilse Geyskens and Toon de Keukelaere	Boerenbond, Leuven
February 2018	Dirk van Gijseghem	Vlaamse Landmaatschappij, Brussel
March 2018*	Veronique van den Langenbergh	Vlaamse Milieumaatschappij
February 2018	Didier Soens	Provincie Antwerpen, dienst integraal waterbeleid, Antwerpen

February 2018	Dirk Uyttendaele	Minaraad, Brussel
February 2018	Marie Verhassel and Geert Rombouts	Vlaams Departement Landbouw & Visserij, Brussel
Ireland		
March 2018	Andrew Fanning	Environmental Protection Agency, Wexford
March 2018	dr. Brendan Flynn	Department of Political Science and Sociology of National University of Ireland, Galway
March 2018	Cian O Lionain and Donal Grant	Principal Officer and Water policy advisor, Department of Housing, Planning and Local Government, Wexford
March 2018	Ian Lumley	Heritage Officer at An Taisce, Sustainable Water Network Ireland, Dublin
March 2018	Thomas Ryan	Irish Farmers' Association (IPA), Dublin
March 2018	Ray Spain	Regional coordinator Waters and Communities Officers (LAWCO), Dublin

Annex 4: Participants workshop 2 – Nijmegen, 12 April 2017

Name	*Organisation*
Dorothea Alternhofen	Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz (NLWKN)
Daan Boezeman	Planbureau voor de Leefomgeving
Michaël Bentvelsen	Unie van Waterschappen
Ann Crabbé	University of Antwerp
Jörg Janning	Deutscher Bund der verbandlichen Wasserwirtschaft; European Union of Water Management Associations
Noud Kuijpers	Projectbureau KRW-DHZ Maasregio
Harrie Menning*	Waterschap Aa en Maas
Diederik van der Molen	Ministerie van Infrastructuur en Waterstaat
Helle Ørsted Nielsen	Aarhus University
Leo Santbergen*	Waterschap Brabantse Delta
Roos den Uyl	Planbureau voor de Leefomgeving
Duncan Liefferink	Radboud University Nijmegen
Maria Kaufmann	Radboud University Nijmegen
Nanda Kurstjens	Radboud University Nijmegen
Mark Wiering	Radboud University Nijmegen

* Following the workshop, Harrie Menning and Leo Santbergen were asked to provide detailed comments on the draft of chapter 5 'Conclusion: key themes and scenarios for the Netherlands'.