Innovative instruments and institutions in implementing the water framework directive: Lessons learnt for the second implementation cycle of the WFD. Case study cross comparison & the QuickScan Training Package

Borowski-Maaser, I; Mostert, E; Junier, SJ

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INNOVATIVE INSTRUMENTS AND INSTITUTIONS IN IMPLEMENTING THE WATER FRAMEWORK DIRECTIVE: Lessons learnt for the second implementation cycle of the WFD. Case Study Cross Comparison & the QuickScan Training Package

Final Version. Submitted: October 2010

Prepared by the Joint Project Consortium consisting of	**Co-funded by**
Erik Mostert and Sandra Junier, Delft University of Technology	**Rijkswaterstaat Waterdienst**
Ilke Borowski-Maaser (editor), Eduard Interwies, Dagmar Ridder, seeconsult GmbH	**BMBF**
Gabrielle Bouleau, Pieter Bots (now TU Delft), Sylvain Barone, Pierre Maurel, Audrey Richard, and Géraldine Abrami, Cemagref	**MEEDDM**
Flavie Cernesson and Sophie Richard, AgroParisTech Engref	**MEEDDM**

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0 Summary for Policy Makers

Summary Message

The Water Framework Directive (2000/60/EC; WFD) is one of the most important environmental directives of the EU. It holds the promise of cleaner European waters and better aquatic ecology. Yet, the novelty of the specific requirements of the WFD, combined with the very tight deadlines, has turned the first implementation cycle into an "experimenting and learning" experience. We assumed that effective institutional settings would shape the circumstances in which measures would actually be implemented.The key to the implementation of the WFD proved to be not so much the existence of basin-level organisations, but an awareness of the necessity of a river basin approach as well as a correspondence between institutions in charge of planning measures and those in charge of implementing them.

Within the i-Five project, three innovative approaches have been identified and evaluated that may support the implementation of the WFD:

- The Area Cooperations in Lower Saxony, in which authorities and stakeholder groups from different sectors work together, linking local and state level.
- The "animateurs" of river - basins in France are a group of individuals who mediate between the water agencies and territorial governments, thus crossing sectorial boundaries and promoting "ownership of the WFD" especially at local level.
- The WFD Explorer in the Netherlands is an innovative Decision Support System that incorporates technical and ecological expertise and can help setting environmental objectives and selecting measures.

Moreover, a "Quick Scan Method" was developed to help water managers in other areas decide whether to adopt/adapt one of these approaches, or possibly develop their own approach using elements from all three approaches.

Concerning the implementation of the WFD in general, the following conclusions were drawn:

1. The institutions that decide on objectives and measures should include the ones that fund and/or implement the measures in order to provide optimal conditions for the realisation of the programme of measures.
2. A trans-sectoral river basin approach needs support from European and national policy.
3. Active involvement of stakeholders is severely hindered by focussing on methodological complexities and administrative demands of the WFD rather than the basic principle of improving the water quality in river basins.
4. Balancing top-down and bottom-up processes is necessary to ensure a basic level of standardisation and comparability of approaches, while at the same time acknowledging local conditions and local knowledge.
5. Non attainment of environmental objectives, in itself, does not necessarily imply bad implementation of WFD.
6. Adaptive water management is the way forward in dealing with the unpredictability of ecology and other knowledge/capacity gaps, such as economic issues.

What the report is about and why the work is important

The i-Five project is a participatory research project concerning **i**nnovative **i**nstruments and **i**nstitutions **i**n **i**mplementing the WFD, financed by the German BMBF, the French MEEDDM and the Dutch Waterdienst. Within this project three case studies (in sub-basins in France, the Netherlands and Germany) have been conducted on the implementation of WFD, the effectiveness of innovative instruments and institutions within the national context, and their potential use in other

contexts. They have been analysed to find out how the central challenges of implementing the WFD were addressed in each region:

- Institutional change for the transposition of the Directive
- Coordination across scales
- Integration between sectors
- Public participation
- Appropriation at local scale
- Role of expertise

In the case studies (listed earlier) special attention was given to three innovative instruments and institutions (i-3's) and the part they played in addressing the different challenges. By this we gained insights into how to learn optimally from these experiences. We translated them into a QuickScan—a factsheet and method which will support learning from other experiences and assess the transferability and adaptability of i-3's to new (sub-)basins.
This report presents the comparison of the case study results as well as the lessons learnt and the QuickScan method.

Aims and objectives of the project

The central aim of the i-Five project has been to support the implementation of the WFD by promoting the transboundary exchange of experiences, by broadening the range of supporting methods and tools available to water managers, and by helping them to develop the best approach for their own circumstances.
Interaction with stakeholders played a central role in the i-Five project. These include the authorities responsible for implementing the WFD at local grassroots level, as well as other stakeholders involved in its implementation. We believe that empirical results will help initiate discussions within and across national borders. In order to reach stakeholders not yet involved in the case studies, we will also organise training and undertake other dissemination activities, such as publishing in professional journals and newsletters and giving presentations at conferences for practitioners.

Results and key findings in relation to report objective

The three i-Five case studies have shown that implementing the WFD is not easy. It requires an integrated approach involving all government levels and sectors, as well as the public, using all available knowledge on ecology and economics—and perhaps even more. The very tight deadlines and the novelty of the specific requirements of the WFD have turned the first implementation cycle into a "learning and experimental" experience regarding the overall decision-making process and its spatial dimension. Six results have been drawn (see summary message and Chapter 5) by the project, calling for an approach to the WFD which is more than a formal and administrative burden.
The results stimulate reflection on the first nine years. To support this reflection in general and also to direct attention towards the potential of innovative instruments and institutions, the i-Five project developed the QuickScan method as a pragmatic approach to learn and to help learning. From the feedback we got during the discussions in conferences and meetings with water managers and other stakeholders, we believe there is a need for and an interest in such a process.

Implications for water policy makers and other stakeholders

The six general lessons (see above) and the QuickScan can help stakeholders to reflect on the implementation of the WFD so far and prepare for the second planning cycle.

1 Acknowledgements

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seeconsult: Bundesministerium für Bildung und Forschung (BMBF), through PTKA (Project Management Agency Research Centre Karlsruhe)
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2 Introduction

This chapter introduces the scope and approach of i-Five and this report more specifically. At the end of the section the reader finds a guide, giving recommendations when best to read which section.

Each country in Europe has its own institutional structure for dealing with water management. This diversity is reflected in the innovative instruments and/or institutions that were introduced to deal with the new requirements for water management based on the WFD. Examples are the explicit settings of environmental aims, strict deadlines to reach the objectives (2015), as well as transparent cost-effective considerations on the river basin scale. A transparent and fast-functioning “moving across” administrative and geographical levels is necessary in order to comply with all these issues, while still conferring with various sectors and interest groups. Innovative solutions to address these challenges have been experimented with. The very tight deadlines and the novelty of the specific requirements of the WFD have turned the first implementation cycle into a “learning and experimental” experience. Together with the use of exemptions, which is wide-spread in all member states, the setting of objectives plays a central role,

Besides general experience with the implementation, water managers and other stakeholders also gained vast experience while establishing innovative instruments and institutions.
The i-Five project links to both: The central aim of i-Five has been to support the implementation of the WFD by promoting the transboundary exchange of experiences, by broadening the range of supporting methods and tools available to water managers, and also by helping water managers develop the best approach for their specific needs.
In i-Five we assume that effective institutions which are transparent for stakeholders, are shaping circumstances in which measures will actually be implemented. We are expecting that such institutions are made mandatory for improving the water status and achieving the WFD objectives.
Based on the inception report (Mostert et al 2009) we carried out three case studies in 2009 in the Netherlands, France and Germany. We analysed the institutional settings and innovative institutions and instruments, which were supporting the WFD at the time of the process, i.e. the setting of environmental objectives and the development of the programme of measures.

Within the i-Five project we compared the different approaches used for defining objectives and for developing and implementing measures, to acknowledge the diversity between the basins. To aid this comparison, we have decided to limit the number of central topics.

The analysis focused on six main features which were identified in the inception report as the central challenges to water managers in the context of the WFD implementation:
1. Institutional challenges for the transposition of the Directive
2. Coordination across scales
3. Integration between sectors
4. Public participation
5. Appropriation at local scale
6. Role of expertise

The three case-studies answer basic questions regarding how local settings and actors addressed the six challenges.

Table 1: Overview on central topics, theme coordinators (between brackets) and emphasis in the basin (X: basic attention, XX: much attention, XXX: specific focus) as presented in the inception report (Mostert et al 2009)

Theme	Weser basin	Thau basin	Meuse basin
1.Institutional changes made for implementing the WFD (Cemagref, Engref)	XX	XX	XX
2. Coordination across scales (seeconsult)	XXX	X	X
3. Integration between sectors (Cemagref)	X	XXX	X
4. Public participation (seeconsult, with support from TU Delft)	XXX	X	X
5. "Appropriation" of the WFD at the local level (Cemagref)	X	XXX	X
6. The role of expertise (TU Delft)	X	X	XXX

In **Germany,** the case study focused on the implementation in Lower Saxony, which covers almost 60% of the Weser basin and undergoes a fundamental institutional reform. The Area Cooperations, as an instrument for the active involvement of organised stakeholders at regional and local level were studied to provide insights on the peculiar balancing processes in rather strongly decentralised systems such as the German Federal system. This Weser basin case study (Ridder et al 2010) points towards the barriers and potentials of such a tool in order to implement the WFD's Art. 14.

In **France,** the analysis of the Thau basin gives a good example of interfaces and their fragility in a relatively successful process of integration. At the same time, it critically discusses the requirements of the WFD for improving the ecological status of waters (Bouleau et al 2010).

In **the Netherlands**, the case study (Junier 2010) presented us with many lessons learnt on the challenges of integrating technical knowledge under discussion in a (modelling) tool; especially taking into concieration the need of high-level understanding of ecological impacts and processes. It focused on the WFD Explorer designed to address one of the main challenges of implementing the WFD: the role of expertise. As stated in the inception report, "the implementation of the WFD requires a lot of expertise on different measures and their impact on the water status. There are different approaches to inserting expertise into practice, but it is not a straightforward process. Issues that need to be addressed include how to deal with uncertainty, how to integrate local knowledge and expert knowledge, and how to communicate expertise and foster trust in the expertise." (Mostert et al. 2009, p.III).

Going beyond the analysis of the region specific approaches, each case study put special attention to an i 3, an innovative instrument or institution. These i 3's were introduced by the water managers to face the challenges posed by the Water Framework Directive. The i 3's have been studied in their national and local context in order to assess their effectiveness and potential use in other basins and countries. They are 1) the "Area Cooperation" in the Weser basin in Lower Saxony, Germany; 2) the animateur in the Thau basin, France; and 3) the use of the WFD

explorer[1] in the Dutch part of the Meuse basin.
The focus on the different i-3s put an additional emphasis on the particularities—in their diversity and similarities -, of the WFD process identified through the case studies (see Table 1).

After studying the implementation of the WFD at a local level in order to understand the conditions of success and failure of an i-3 we developed a method to facilitate learning from experiences with innovative instruments or institutions (i-3). This "QuickScan"-method will be presented and introduced to check transferability and for better identification of those characteristics and design parameters which are specific to the success of i-3s.

Presenting the case studies in a participatory action research setting allowed both the involved stakeholders and researchers to deepen their understanding on the challenges of implementing the WFD. The progress of the case studies was presented at two international stakeholder meetings whereby stakeholders had direct access to the experiences in the other cases. Small excursions were organised as a regular activity at these meetings to facilitate the exchange of experiences. Within the individual case studies regions national workshops served as means for knowledge generation and exchange. It ensured the dissemination of the results to policy makers and practitioners. Questions concerning fact-finding and understanding can be directly answered during the interaction between researchers and other participants.

Reading Guide—When to read what

For quick readers with an interest in our main outcome, we recommend, next to the Policy Summary (Chapter 0) and the outlook (Chapter 7), Chapter 5. On a few pages it summarises our general lessons learnt during the 1st WFD implementation cycle, highlighting only the most prominent issues.
A more profound comparison between the three different case studies can be found in Chapter 4. These case studies are compared on their institutional settings, issues on cross-scale coordination, cross-sector integration, public participation, local appropriation of the WFD and the integration of expertise. Beneath each topic (sub-section), we present lessons learnt for the 2nd implementation cycle of the WFD.
For readers interested in an overview on the settings and challenges along the studied regions, we recommend Chapter 3. A summary of the case studies is provided, highlighting those challenges which are later taken up.
Acknowledging the need for improved learning processes, i-Five devoted much efforts in developing QuickScan: this is a method which helps to identify the most central aspects of innovative instruments and institutions (i-3s) for improving their benefits to other basins. Chapter 6 presents the general approach, complemented with the documents in Annex 1.1-1.4 on the application for the i-3s studied in this project: the Animateur, the WFD Explore and the Area Cooperations.

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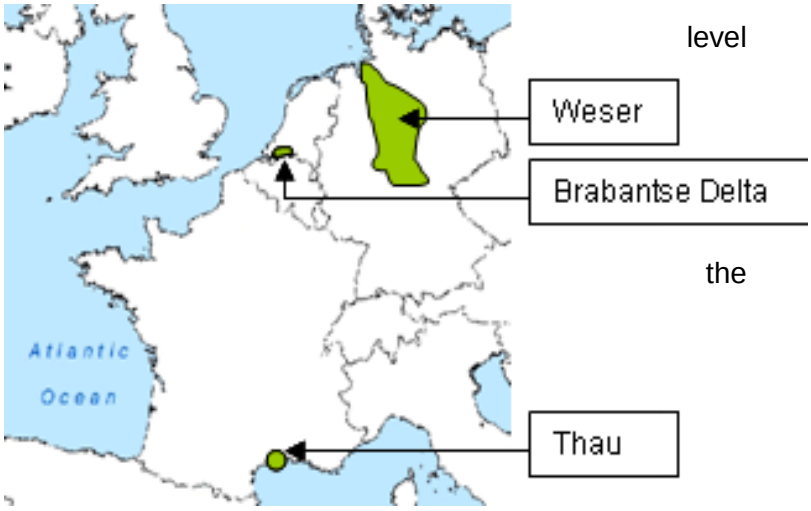
[1] a decision support system for setting environmental objectives and developing programmes of measures

3 Introduction of case studies

In this chapter, the three case studies are introduced by a short summary of the much more elaborate case studies reports to give readers a more case-oriented overview. Specific characteristics and observations in the case studies will be partly repeated in chapter 4 and 5. For further information, the reader is kindly invited to consult the full reports on our website (www.i-five.eu).

Figure 1: Location of i-Five case study basins



The rationale of the i-Five project was to focus on innovative practices at local level and then to draw conclusions on what could be learned from such cases and what could be transposed. The researchers selected case-studies which were considered innovative with regard to instruments and institutions for implementing the WFD. Although the case studies might not reflect the rich diversity of institutional settings in the Member States, they helped us to identify shared and specific barriers as well as potentials for approaching the WFD.
This chapter presents a picture of the specificities and challenges of each case study taking into account the evolution during the last year and reflections on the reputation of the cases as being innovative.

3.1 Summary of the German case study

Ten river basins were defined in Germany with the introduction of the WFD. The Weser basin district is the largest Germany-only river basin district. However, it crosses the borders of seven states (Bundesländer). Lower Saxony covers about two thirds of the basin.

Case study area

The German case study was conducted in the river basin district of the Weser by seeconsult in cooperation with the management office of the FGG Weser. The river basin district of the Weser extends from central to northern Germany, including the central highlands in the south and the central plains in the north. This catchment area has approximately 9.3 million inhabitants. There are three main sub basins: in the southwest the Fulda / Diemel catchment, in the southeast the Werra catchment and the biggest sub basin in the north belonging to the Weser river. The total catchment size of the Weser river basin district is 49,000 km², with the largest part of 29,500 km² falling into the territory of Lower Saxony.
The case study focuses on the sub-basin called Weser river, which forms the lower part of the river basin district Weser. It is located in north-west Germany/ Lower Saxony. The main pressures of the catchment area are caused by diffuse nutrient pollution and hydro-morphological modifications. It is estimated that 62% of groundwater bodies of the Weser river basin are at risk of failing the good

status because of diffuse nutrient inputs. For the surface water bodies about 60% are designated "heavily modified" due to hydro-morphological reasons.

Figure 2: The Weser Basin. The black line indicates its borders. Red lines show boders of federal states. Source: FGG Weser (www.fgg-weser.de)

In Lower Saxony, considering the size of this federal state, the changes in administrational settings, the limited network among the stakeholders before the implementation of the WFD and the existing pressure in Lower Saxony presented conditions and barriers that are typical for Germany, and may be slightly more extreme in comparison to other German (sub-)basins. Due to this, the institutional settings in Lower Saxony were studied to identify insights on innovation regarding the WFD. Special attention was given to public participation and integration of different scales. Area Cooperations which are an instrument for active involvement of organised stakeholders at regional and local level were analysed. This has provided many insights on the peculiar balancing processes in rather strongly decentralised systems such as the German Federal system.

WFD implementation in Lower Saxony

In the German federal system, the federal law provides the general framework (now closely linked to the WFD content and requirements) for most of the waters[2]. At the same time, the Länder have the legislative competence for laws and management of most waters[3]. Before the implementation of the WFD, the Länder cooperate with regard to the main rivers, e.g. in the "Arbeitsgemeinschaft Weser". Including now the complete basin, coordination associations between the Länder were established in Germany, linking Länder in the different river basin areas (LAWA 2001, 9; Hartje 2006). This enabled integrating the newly established river basin districts (and sub-basins), such as the Weser basin district, to the old

[2] In March 2010, fundamental changes in German water law came into force. These included nationwide uniform requirements concerning the management of surface and coastal waters, as well as ground water. The law prohibits turning grassland into arable land in riparian zones that measure 5 metres in breadth. See http://www.bmu.de/english/current_press_releases/pm/45821.php

[3] The exceptions are waters of first (highest) order which are federal water ways (Bundeswasserstraßen) such as Rhein, Elbe, Weser and lower part of the Ems.

structure of the states. Thus, structures and competencies were retained, although the spatial reference area for water resources management was changed, leading to a purely coordinative additional administrational level.

The Ministry of Environment, including its technical authorities such as the Lower Saxony water management, coastal defence and nature protection agency (NLWKN), is responsible for water management policy in Lower Saxony. Although partly supported by the Area Cooperations, they formally defined the objectives for WFD implementation and classified water bodies as natural, heavily modified (HMWB) or artificial. As the local level is responsible for maintaining second order and smaller streams and rivers, most of the necessary measures for reaching good ecological status/potential need to be implemented under the auspices of the local level. In Lower-Saxony water management at a local level is performed by a large number of smaller organisations, private or public, each responsible for specific aspects of water management. Municipalities or water associations for example have the competency of executing water management measures for WFD. However, their resources were originally not designed for reaching the level of water quality as prescribed by the WFD; thus, they need additional funding e.g. from the NLWKN. The NLWKN cannot oblige these organisations to take the measures that form part of their policy. As a consequence, the local level needs to be motivated to respond to the demand for more water related measures.

This was one key consideration for setting up a three-layered participatory process consisting of an advisory board at state level, regional forums and local-regional Area Cooperations. The latter were the instruments best suited to actively stimulate a bottom-up approach on the development of a programme of measures and other reports in the context of the WFD. Area Cooperations invited representatives from organised stakeholder groups interested in, or responsible for, part of the water management in a sub-basin.

In addition, water management in Lower Saxony was strongly influenced by the administrative reform which started in May 2003 and is still ongoing. Core of this reform has been to remove the administrative layer of the regional governments, which had existed for 175 years. However, several tasks were not taken over, neither by the ministerial nor by the municipal level. The result was a number of additional specialised agencies (Sonderbehörden), which were established on the intermediate level and were staffed with additional personnel based on their newly assigned tasks. A study concerning the environmental administrative settings in Germany showed that the radical restructuring in Lower Saxony poses a serious threat on the workability of the administrative structures (SRU, 2007).

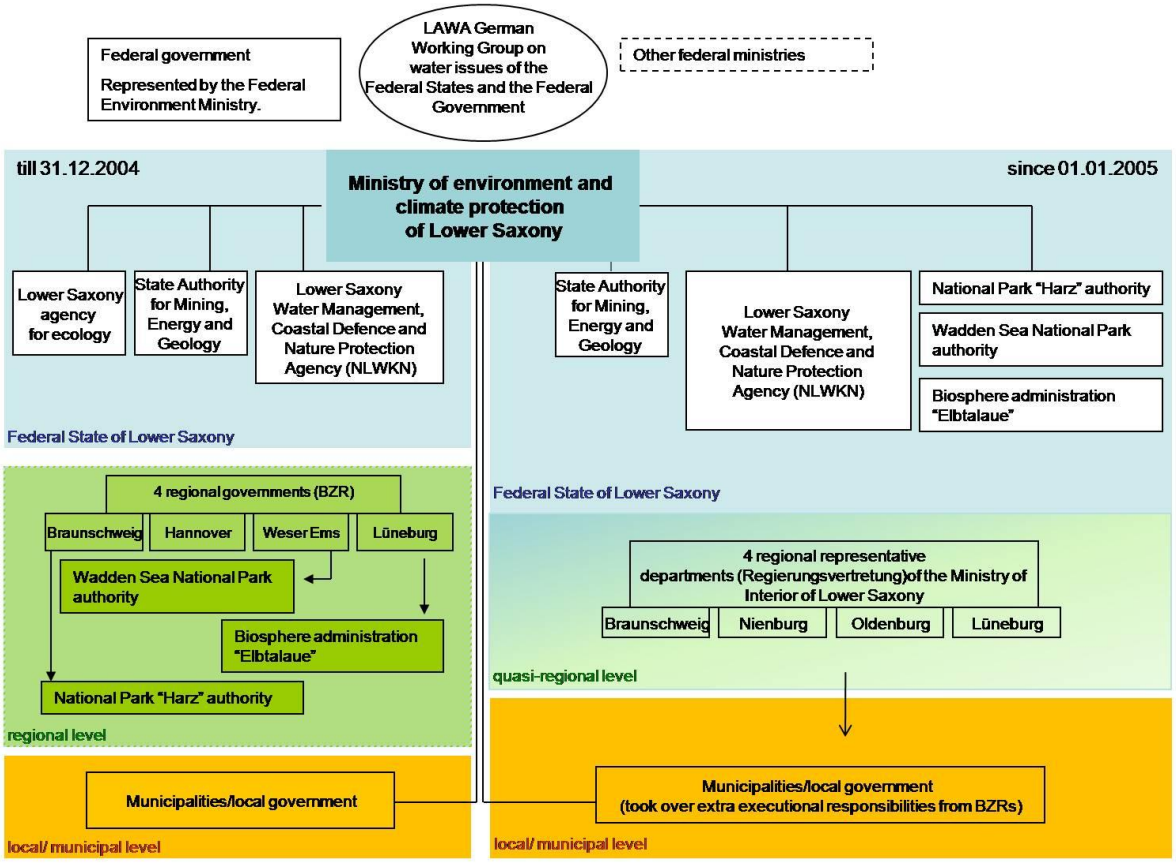


Figure 3: Structure of Water Management in Lower Saxony before and after the administrative reform (modified from MU 2004 http://cdl.niedersachsen.de/blob/images/C6299509_L20.pdf)

As a result of the administrative reform, the formal approach to water management became more top down, with the supreme level responsible for more tasks.
The municipalities—facing financial tension—were often confronted with more tasks, but de facto not more budget. Even though they were—at local level—one of the central actors to implement measures they missed the transparency e.g. on the selection, prioritisation and on planning the financing of measures.
A first non-structured bottom-up collection of measures in the Area Cooperations resulted to around 2,000 measures which were differentiated into

- measures that can be immediately implemented (around 600-700),
- measures that cannot be immediately implemented (around 1,100),

measures that for the time being can not realistically be implemented, but are considered important to reach good ecological status in subsequent WFD-implementation cycles.

Criteria to make this categorisation were: the availability of land for the measures in question, favourable legal conditions, a private or public body volunteering to implement the measure and a guaranteed matching fund of the implementing body. The planning of measures was based more on feasibility than exclusively on what would be needed to achieve the good status. This was partly due to the delay of the deficit analysis, but also to the parallel processes of implementing the WFD in a bottom–up way while developing guidance in a cooperative process at top-level in order to support the lower levels. In an attempt to respond to the WFD requests and its tight deadlines, such parallel processes can probably not be avoided. However, they create tensions and frustration especially at the lower level where the efforts might later have to be adapted to the top-

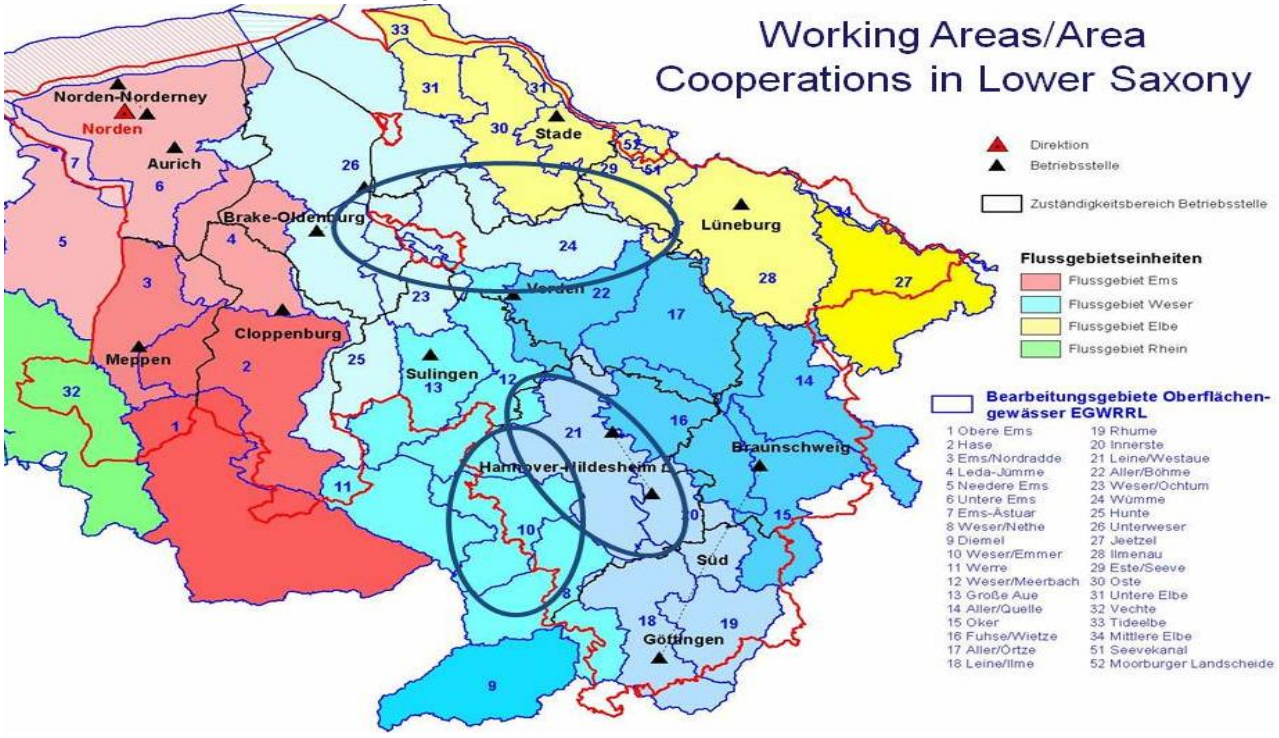
down guidance. As an example: the stakeholders often criticised the setting of environmental objectives for not adequately using the Area Cooperations, integrating more local knowledge and involving further interest groups. The NLWKN did not supply the objectives in time to the Area Cooperations to give direction to the development of the programme of measures at local level.

In addition, it was often unclear to the stakeholders what criteria and reasoning led to a certain water body being designated a HMWB. Especially the nature organisations criticised this process as non-transparent. The checklist with nine steps which was applied in the Area Cooperations to designate a HMWB or AWB left a rather large leeway for the interpretation of the criteria. For example, a question like “do we have hydro-morphological modifications?”can be answered in many ways and does not seem to be sufficiently specific for judging a water body like HMWB. It allows for a significantly different treatment of a water body within the WFD, rather than it being classified as “natural”.

Area Cooperations as innovative instrument for involvement of organised stakeholders

As the states in Germany have the main competences in implementing the WFD, they are also responsible for implementing participatory activities as prescribed e.g. in the WFD. Lower Saxony introduced an instrument, the Area Cooperations, for actively involving organised stakeholders in the WFD process. The Area Cooperations act at a level between local and regional. Twenty-eight Area Cooperations have been set up by the Ministry of Environment of Lower Saxony in autumn 2005 as a regional and direct form of active involvement, covering the whole of Lower Saxony. The Area Cooperations have been designed as long-term institutions with the aim of contributing to the implementation of the WFD in regard to surface waters. Geographically, in most cases they overlap with the “working areas” that have been defined as the lowest working level on the hydrological scale for implementing the WFD in Lower Saxony.
While the MU has provided basic (and rather limited) funds and the general organisational frame, the Area Cooperations are in charge of the detailed internal rules in procedure,

Figure 4: Area cooperations in Lower Saxony: the bluish shaded areas belong to the Weser basin. The red line indicates the territory of Lower Saxony (adapted of Nieders. Umweltministerium). Circles indicated those Area Cooperations which i-Five focused on.



Most of the Area Cooperations have drawn up their formal rules for internal procedures, in which the executive management and other duties, such as faciliation, are determined. In some cases these rules make it explicit that members of the Area Cooperations must be nominated by the NLWKN.

Area Cooperations were set up to contribute to the implementation of the WFD especially as outlined in Art.14 by supporting the development of the different reports. They were also planned as a tool to inform organised stakeholders on the progress and the impacts of the WFD. Main tasks of the Area Cooperations have been (see MU 2005d):

- For Monitoring: Accompany monitoring concepts for the respective area under consideration of regional particularities.
- For the Definition of Management questions: Define the most important water management questions in the area; conduct a deficit analysis based on the C-reports.
- For the programme of measures: Initiate and conduct the discussion on measures.
- For the river basin management plans: Development of general valid management goals; final identification of heavily modified (HMWB) and artificial (AWB) water bodies; justification for the extension of deadlines for a step by step implementation of management goals; examination of the necessity of lower environmental objectives.

Stakeholder groups represented include districts, cities, municipalities, water management boards and associations, agriculture and forestry, water providers, industrial representatives, environmental associations/nature protection and the NLWKN. According to local-regional situations some of the following were also included: fishery associations, dike associations, hydropower operators, administrative representative for inland water transport, the Agency for geology and mining of Lower Saxony, roadworks administration and further special administrations. Next to the permanent members, there is the option to expand the group to other participants for providing specific input.
Three Area Cooperations (see Figure 5), including interviews with representatives and a literature study were studied in detail. This was complemented with results from an evaluation of all Area Cooperations in Lower Saxony (Ridder et al 2007) and a workshop. About twenty water managers were invited to a workshop in October 2009 in order to identify further potentials and constraints of Area Cooperations, also in respect to their potential transferability.

Transferability of Area Cooperations & their innovative character

Before the WFD German water resources management had often lacked multi-stakeholder involvement but included bi-lateral contacts (i.e. between one stakeholder group and the water authority), hearings or written consultation procedures. In addition, if active involvement was sought, this happened mainly at project level (i.e. in general locally and terminated after 2-3 years). Establishing an area-wide and long-term approach for involving organised stakeholders was therefore rather innovative in the context of German administration. Similar instruments have been implemented not only in Lower Saxony but also in other states as well as in European member states.
The establishment of Area Cooperations provided an innovative approach in terms of acknowledging the stronger needs for coordination and integration which have been introduced by the WFD. As a concept, they create a space between the local and the regional decision making level, which is open to different interest groups for discussion and negotiating.

However, the process of participation, i.e. bringing different representatives together, raises

stakeholders' expectations. The slow development of personal working relationships requests a transparency perceived by the different stakeholder representatives (i.e. the right amount and content of information to enable trust in each other's actions). Stakeholders expect more impact of their input—or at least more feedback on it in comparison—to e.g. a written consultation processes. Having the experience that this expectation is often not fulfilled, they are rather cautious in actively engaging in the process.

In addition, operationalising decisions/recommendations developed in Area Cooperations need appropriate resources and commitment by the concerned stakeholders. Both aspects strongly call for skilled facilitation of Area Cooperations as well as the financial support for their implementation and the implementation of the resulting measures. Considering a potential transplantation of the institution "Area Cooperations" into different basins, this should not be underestimated. The case study results show that if information overload and in-transparency is perceived by the participants, the Area Cooperation provide more of a forum for enhancing frustration and conflicts. Further, if a formal to semi-formal instrument already exists that intervenes similarly at this "in-between" level, the potential for merging these two activities should be explored and used.

Area Cooperations can not directly improve the implementation of measures. However, if managed carefully, they can contribute to a coordination process of selection and prioritisation of measures. Furthermore measures proposed by the Area Cooperation may have a larger chance of being executed because the parties involved can see the benefit of the measures. Finally, Area Cooperations have to be embedded in a comprehensive process of public information and involvement and cannot act as a stand-alone tool.

3.2 Summary of the French case study

Case study area

French water resources are gathered in six large basins, on which six water agencies have been set up since 1964. They are supervised by a basin committee whose composition is fixed by law (water users, environmental NGOs, local authorities and state administration) and members that are appointed by the prefect[4] coordinating state services in the basin. Water agencies' duty is primarily financing water infrastructures through a user-pay principle. Water uses control is ruled by the state administration. Since 1992, the state administration and the water agency of each district jointly elaborate at basin level water management plan (SDAGE[5]) that sets objectives for water quality and quantity and defines priorities for water usage. Under the WFD, the SDAGE are to become the management plans.
Wherever the SDAGE critically points out a lack of local coordination among water uses on a sub-basin, it requires a local plan (**SAGE**[6]) being established by a legal local commission on water (**CLE**[7]). The composition of the CLE is fixed by law, and members are appointed by the prefect(s)

[4] The French administration has local offices in Régions and Départements under the authority of a prefect, a state officer appointed by the government

[5] Master basin plan for water development and management « Schéma Directeur d'Aménagement et de Gestion des Eaux »

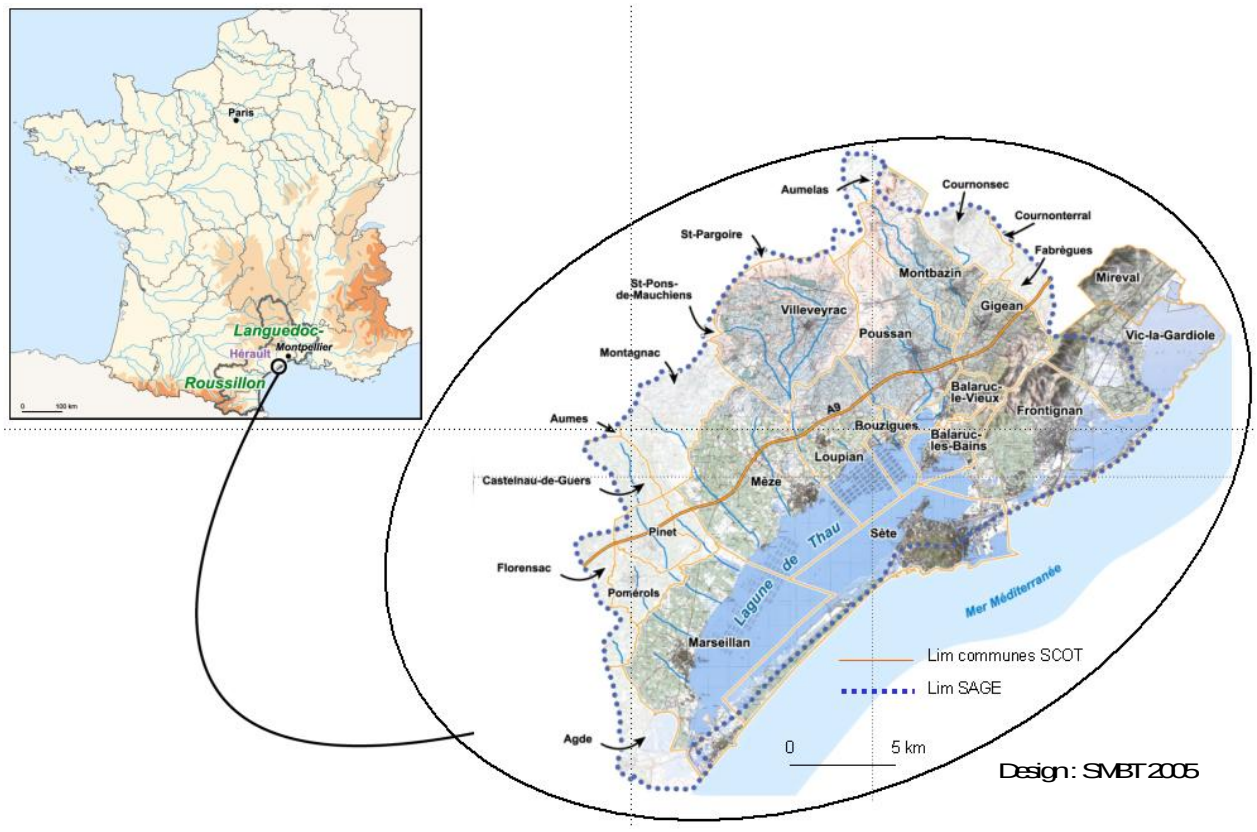
[6] Local sub-basin plan for water development and management « Schéma d'Aménagement et de Gestion des Eaux »

[7] « Commission Locale de l'Eau »

of the concerned Département(s). The CLE gathers political officials of local authorities, water users and representatives of the administration. It has decision power on local water allocation and local water quality objectives but these decisions must comply with the SDAGE. The CLE however has no budget. It relies on a local authority hosting the process. This local authority may hire an employee to steer the process. This **facilitator** is called the *"animateur" of the SAGE.* Alternatively, the local authority may rely on a private consultancy for this task.
The new law of 2006 transposing the WFD (LEMA) strengthened the content of SAGEs. They have become the "ideal local tool" to combine WFD objectives and participative management of water resources.
Not all sub-basins are engaged in a SAGE process however; only those identified in a SDAGE are required to do so. Local authorities in charge of public water services or local river (lake, lagoon, …) management may cooperate through other procedures to coordinate their investments like a river contract (or lake, lagoon contract). In such cases, coordination may also rely on a facilitator called an *"animateur" of the sub-basin* hired by a local authority.

The French case-study focuses on the Thau territory. It has been identified by the SDAGE Rhône-Mediterranée as one of the sub-basin where a SAGE should be elaborated. It is **a very small area** compared to the Weser basin or the Brabantse-Delta area. We focus on this level because the basin-oriented approach was already in place in France and because WFD measures should be implemented at this level in many French sub-basins.

Figure 5: Location of the Thau territory within the Region Languedoc Roussillon and the Département Hérault. Hérault, in the Rhône-Mediterranée hydrographical district.



The Thau territory derived its name from the Thau lagoon on the Mediterranean seashore. It is located in the department of Hérault in the South of France, 20km South-West of Montpellier, the regional capital (see Figure 5).

There are twentytwo municipalities located in the Thau catchment municipalities, but our case-study focuses on those fourteen closest to the lagoon, which are organised into two inter-municipal joint-boards: the CABT (Communauté d'Agglomération du Bassin de Thau) in the South and the CCNBT (Communauté de Communes du Nord Bassin de Thau) in the North. The present population is 130,000 inhabitants and it nearly doubles during the summer season. Most of the drinking water resources come from the Herault River on the Western side of the Thau territory.

Hydrologically, the lagoon catchment spreads over 443 km^2, of which 75 km^2 are brackish waters of the Thau lagoon. Its climate is Mediterranean. The land includes 30 km of sea beach. Biodiversity and landscapes are acknowledged as extremely rich. Its catchment area is drained by numerous small streams with intermittent flows. The geology of this basin is strongly contrasted: the northeast is mainly formed by karstic limestone while clayey marls dominate the southwest.

The main economic activities are related to the harbour of Sète, shell-farming and fishing, vineyards, tourism and spa. Industries and vineyards nevertheless find themselves in a crisis. In the Thau lagoon, shellfish farming activity (oysters and mussels) covers about 20% of the whole lagoon area and produces about 15,000 tons of shellfish yearly, providing work for approximately 2,000 people..The lagoon production depends to a large extent on nutrient inputs into the ecosystem, supplied mainly from fresh water.

Anthropogenic pressure on the catchment area is due to agriculture (mainly vineyards), agro-food and fertilizer industries and domestic sewage. Due to these pressures and to the low water exchange, the Thau lagoon has, during several summers, experienced, acute eutrophicational problems with anoxic crises (*malaïgue*). In August 1997, nearly one third of the oyster annual production was lost. Since 1998 it is also the influence of harmful algae blooms (Alexandrium) which has a direct impact on shellfish production and commercialisation.

This Thau area is very attractive for tourists and urban workers commuting to Beziers and Montpellier. It is accessible by highways A9 and A75. A future Montpellier TGV station is presently being discussed and could be located in the South West of Montpellier, close to the Thau area. Demography and the induced real estate market are growing extremely rapidly. Projections for 2030 predict the Thau territory to have one of the most growing populations in France. These current trends have resulted in the development of a so-called residential economy that appears to be competing with the traditional economy. This also threatens existing natural ecosystems.

WFD implementation in France

In France, river basin management and planning had already been organised by water agencies for forty years when the WFD was enacted. Hydrographical districts in general fit the limits of the water agencies although some agencies have to deal with two districts (Rhin-Meuse, Rhône-Méditerranée & Corse). Despite this institutional consistence with the WFD, French legislators decided to recentralise both expertise and decision-making in order to implement the WFD. The ONEMA was created to gather and provide,expertise and to issue technical guidelines for all water agencies and state offices. A stakeholders' platform was set up to collectively establish the level of ambition of the objectives under the Grenelle process. Moreover the annual budget of water agencies was submitted to approval by Parliament.
Basin-coordinator prefects, who already supervised basin planning processes as well as command and control strategies, were designated as competent authorities at district level. This organisational decision helped to steer the process of implementation by centralising data, decision-making and responsibility for basin management in one place. It resulted in good coordination on all levels of state authorities. However, neither water agencies nor basin-

coordinator prefects have the power to implement measures themselves. They rely on “maîtres d’ouvrages”, i.e. local authorities such as the municipalities competent in water projects and private owners. These maîtres d’ouvrages cannot be forced to implement the planned measures. If they are willing to take measures their local funds might need to be complemented e.g by departemental water agencies or European funds. This resulted in many uncertainties concerning the actual implementation of measures.
At sub-basin level many participatory processes occurred. In all water agencies, the district level set up geographical commissions to gather local expertise and opinions on the environmental objectives, as it had already been organised to produce the basin plans approved in the 90s (SDAGE). SDAGE were to become the RBMP under the WFD and were revised accordingly. In 2006, geographical commissions were given more power to set priorities within the programme of measures. More locally, in catchments identified by SDAGE as threatened by pressures, many small sub-basins already had local river-basin plans (SAGE) which were revised for the process of the WFD. Some others were initiated. Local authorities engage differently with the WFD process according to the significance of water in their local political agenda.
The implementation of the WFD in France was a success in terms of level of ambition of the ecological objectives. France designated 574 groundwater bodies and 11523 surface water bodies (of which 94% are rivers). As a result of the Grenelle, 66% of surface water bodies are to achieve the good ecological status by 2015. Objectives also target diffuse pollution, notably because France strongly relies on groundwater for drinking purposes. Given the separation of competencies in planning, implementing and funding of measures is still uncertain how such ambitious goals are going to be implemented at local level
Public participation and involvement of local authorities varied from one basin to another. The Rhône-Méditerranée basin was a-typical in this respect as it strongly promoted a bottom-up approach to the definition of objectives and measures. It also supported interfaces between land-use policies and water policies. Integration between sectors was therefore stronger in this district.

Innovative instruments or institutions
In the Thau basin, we focussed on the role of the river basin facilitator or “animateur de bassin versant”, which steered the SAGE process, relating land-use planning and water planning procedures and fostering communication among stakeholders. Within the local water commission (CLE) and beyond In the Thau basin, the animateur is hired by the local authority SMBT implementing the river basin plan for the lagoon (SAGE), the lagoon contract, the land-use plan of the area (SCOT) and the Natura 2000 process. The water agency partly funded his position.
We showed that this role was a key factor in implementing the WFD, in the sense that it bridged the gap between technical knowledge, state procedures and local stakes. It helped to integrate sector-based policies at local level. It also supported public participation because the animateur set up different commissions around the SAGE process to get feedback from stakeholders and often personally contacted them to share information. Moreover it supported the general commitment of local communities in improving the quality of the lagoon.

Transferability of the Animateur de Basin

The need for human interfaces facilitating coordination between sectors, scales and different types of knowledge has been identified as central in the French case study.
Integration between sector-based policies and setting water quality as a priority for the area does not only result from this role. We showed that it also resulted from the history of the area in which state services have long had a large influence and participate in the promotion of oyster production and fishing. However there is no structural cause explaining the environmental protection of Thau. It results from a series of political engagements. The discourse on quality (nice landscape, water quality, oyster production, vineyard environmental-friendly practices) is part of a territorial narrative supported by SMBT *animateurs*, environmental state services, environmental associations (i.e. CPIE) and a number of politicians.

Therefore we believe that water facilitators may also support WFD implementation in other areas where water is not central in territorial policies, because they are able to translate water issues in diverse arenas and to identify ways of action.

Reflections on the reputation of the site as being innovative

In France the implementation of the WFD lies in the responsibility of the Regional State Office of Environment (DREAL) and the water agency (Agence de l'eau Rhône Méditerranée). Under the authority of the basin prefect both entities tend to consider that what happens in Thau is favourable to WFD implementation. Thau is often heralded as a template of what should be done.
The Thau territory also has a good reputation among scientists of the region because many research activities are taking place there. Access to information is facilitated by political officials and their staff who are willing to participate, research and to innovate.
Such a reputation has much to do with the fact that water and water science make sense for political officials as they promote the preservation of their territory and support the struggle against other territorial claims, such as housing or mass-tourism. Water flows and water use inter-dependencies support the legitimacy of their territorial project.
However water alone does not make a political project for a territory. It may be one element combined with the other relevant topics in the region. Such a combination brings on tension. Understanding these tensions in this favourable context gives us sharp insights considering challenges raised by the WFD in more complex contexts. Therefore Thau is a very interesting case to understand integration between sectors.

3.3 Summary of the Dutch case study

Case study area

The Netherlands is located in the Delta of four large rivers: the Rhine, Meuse, Scheldt and Ems. The case study area is the Meuse river basin, a rain fed river, which means high discharges in winter and low discharges in summer. The Dutch part of the Meuse basin has a surface area of 7,700 km^2 and is home to 3.5 million people. Around the growing cities there is industrialisation, but about 70% of the land area is used for agricultural purposes. Intensive animal husbandry (pigs, cattle and chickens) and mixed farms are prominent in the area. The intensive farming has far-reaching consequences for air, soil and water quality (Ministerie van Verkeer en Waterstaat 2009).
Water management policy planning and legislation at the national level is formulated by the Ministry of Public Works, Transport and Water Management (V&W). Policy planning for the implementation of WFD is performed together with the Ministries of Agriculture, Nature and Food Quality (LNV) and the Ministry of Spatial Planning, Health and the Environment (VROM). Rijkswaterstaat implements water policy for the state waters. Regional and local water management policy and implementation are performed by the waterboards, except from sewage collection which is a responsibility of the municipalities. The twelve provinces supervise water boards and municipalities, regulate the largest groundwater abstractions and have important competencies in the field of spatial planning and nature protection.
Waterboards are institutions specifically in charge of the management of regional waters, operating at the same functional level of government as the municipalities, although the area they govern is much larger. They have a board with representatives according to the voters' interests. Most of the seats are devided among parties through elections amongst the inhabitants. Some seats are reserved for representatives of interest groups: farmers associations, the chamber of commerce

and the association of owners of nature areas. The chairman (dijkgraaf or watergraaf) is appointed by the queen and holds a position comparable to the mayor. The waterboards have many competencies in regional water management, concerning safety against flooding, water quantity management, sewerage treatment and management of water quality and ecology. They regulate emissions on surface water and are responsible for the aquatic environment of regional (or non-state) waters.

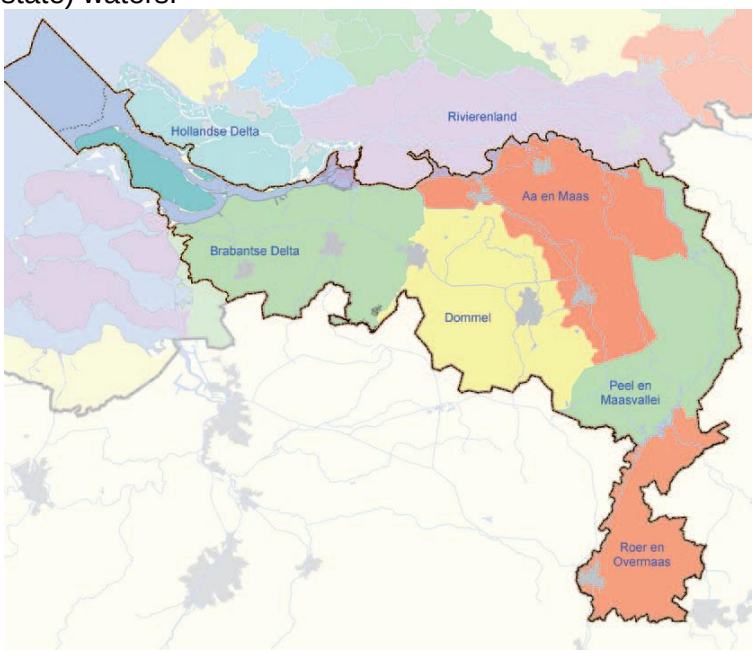


Figure 6: Map 1 Waterboards in the Dutch part of the Meuse basin (Ministerie van Verkeer en Waterstaat 2009)

WFD implementation in the Netherlands

The Netherlands has implemented the WFD keeping the existing financial, legal and institutional framework intact as much as possible.

The competencies of the different water management organisations have remained the same. They have all been appointed as competent authorities for implementing the WFD and only a coordinating structure on river basin level has been added. These River Basin Commissions consist of representatives from the councils of all involved competent authorities: provinces, waterboards and municipalities, together with representatives from the Ministry of V&W. These commissions have no legal competencies: agreements in the commission have to be brought to the various councils to decide upon. Measures in water management are generally financed and executed by the same authority that is responsible for drawing up the plan of measures. Cost recovery for water services was high and will remain high.

An advantage of the institutional arrangement is that policy development, implementation of measures and funding are well tuned to each other. This creates good conditions for the implementation of the programme of measures. A downside of this arrangement is the complexity of the coordination. The process had to be performed on different levels and between sectors, coordinating a huge number of competent authorities and also with all other involved stakeholders. In the Meuse area a project bureau was staffed to support the coordination process. At sub-basin level ‘area-processes’ were organised to promote coordination and cooperation between water boards, municipalities and other stakeholders. On local, regional, river basin and national level participatory processes were performed. Moreover, water ambassadors promoted cooperation between municipalities and waterboards.

The WFD implementation process appears to have been effective in establishing coordination

across scales. The waterboards have taken a lot of initiative and have been influential in determining objectives and measures. The development of the River Basin Management Plan was generally bottom-up. Objectives were set on national (natural waters) or provincial level (highly modified or artificial waters), but were based on proposals from the waterboards and local Rijkswaterstaat divisions. This enabled both attention for local tailoring and for coordination at a higher level. In theory, the institutional structure should also promote the integration of sectors, but in practice the water management sector took the lead. This is not only because they felt most responsible, but also because the other sectors, such as agriculture and spatial planning, gave priority to other, sectoral interests and were not willing to consider implementation measures in their own sector.

Methodologies for determining the water status, setting objectives and choosing measures together with administrative procedures on how to report, did not exist at the start of the WFD implementation on a large scale. Methodological and administrative issues often dominated the deliberations in the planning process at all levels. As national guidance was often late, some other actors, such as STOWA (the knowledge institute of the waterboards) and the Meuse project bureau, took the initiative to develop part of the methodology or administrative procedures. The national procedures are partly based on these initiatives.

In the Netherlands 724 surface water bodies have been identified, as well as 23 ground water bodies (Ministerie van Verkeer en Waterstaat et al. 2009). The water bodies are mostly classified as heavily modified (42%) or artificial (56%). As hydro-morphology is seen as one of the major problems in reaching WFD objectives, restoration measures constitute a major category of measures (Ministerie van Verkeer en Waterstaat et al. 2009). Another major problem is eutrophication. Although agriculture causes about two thirds of the nutrients in the water (Planbureau voor de Leefomgeving 2008), no national policies were adopted to reduce these emissions. Instead, improving the efficiency of waste water treatment plants is proposed as a (not very cost effective) measure, most probably because the water management sector can do this on its own.

The number of participatory processes (140 in a small country) and the sheer technical complexity of the deliberations on WFD hindered the active participation of stakeholders. Only the professional and large stakeholders could really handle the complexity. Intermediaries such as coordinating commissions, water ambassadors and others have played an important role in the process of developing the RBMPs. Still, according to several interviewees, the main result of the area process was the increased support for WFD measures both from municipalities and from organised stakeholders, because they had plenty of opportunities to discuss different points of view.

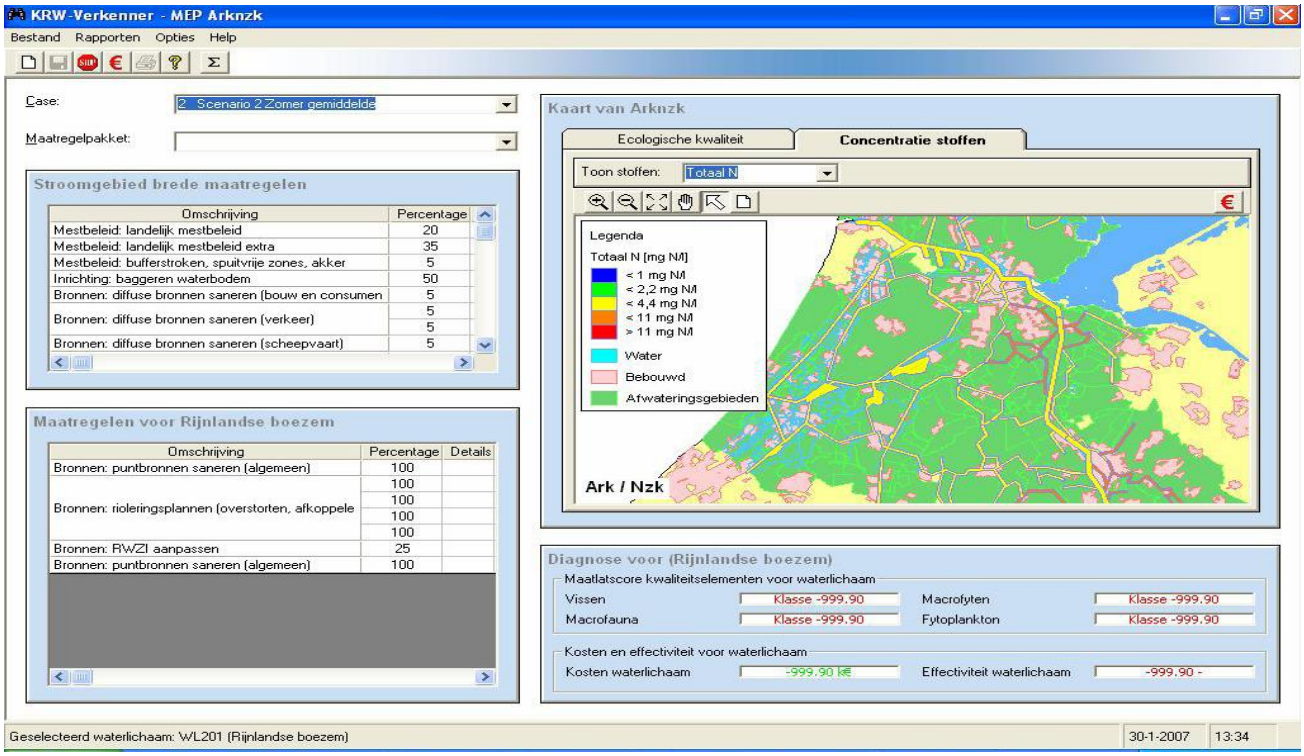
The level of ambition concerning the WFD objectives seems to have been determined by the concern that being very ambitious would have negative consequences for the agricultural sector in the Netherlands. This concern originated from the Aquarein study, published in December 2003 (Bolt et al. 2003). This study suggested that to reach a “good water status” it might be necessary to reduce the agricultural area by two thirds. Following the upheaval caused by the report, an “ambition brief” on WFD implementation was published, in which the Cabinet expressed its intentions to establish “realistic” goals (Staatssecretaris van Verkeer en Waterstaat 2004). Basically, “realistic” means that the Netherlands will do what is “reasonable”, but will not go to the very limit to achieve a good status for all waters (Mostert 2008). This has been a leading principle for the implementation process. Furthermore, not reaching the set objectives was felt to lead to repercussions and perhaps fines from the European Court of Justice (ECJ). To be on the safe side it would be best to set the objectives to a level that could realistically be reached.

The farmers have taken a keen interest in the WFD. The farmers´ organisation LTO was active in basically all the seemingly different board groups and the area processes. They lobbied on all levels of decision making and sent in written responses to the various draft plans. LTO organised meetings for farmers, provided information on their website and through newsletters and brochures. Whether it was caused by the active lobbying by the farmers organisations or not, the impact of the WFD on agriculture appears to be limited.

The Water Framework Directive Explorer as an innovative instrument for WFD

Knowledge integration and harmonisation has been always a central issue in water resources management. For this reason, the Dutch case study focused on the process of establishing the WFD Explorer as a tool for knowledge management.

Figure 7: User interface WFD Explorer (Deltares 2008, http://www.krwverkenner.nl/files/Intro_KRW-Verkenner.pdf)



The Water Framework Directive Explorer is a decision support system designed to support the implementation of WFD. The interface allows users to plot the status of water bodies on maps of the area, using colour codes. Users can choose measures from a list, apply them to a water body, and see whether this measure improves the water status (see Figure 5).

The WFD Explorer was developed to supply expertise to policy makers and decision makers to support WFD implementation. A lot of thought went into developing a user friendly interface. In practice, it was not used by policy makers or decision-makers, but by specialists, such as hydrologists, water quality experts and ecologists. The results were in some cases clearly wrong and in some unexpected, inspiring mistrust. As they could not trace how the results had been gained, due to a lack of transparency in the calculation base, many of them rejected the instrument. It was designed to provide general insight and could not provide the level of detail that the specialists wanted. An important reason for this is that the existing knowledge on the effect of measures on ecology is insufficient. Since the specialists did not trust the instrument, the policy makers and decision makers, who were the intended users, they never got to work with it.

A positive effect of the WFD Explorer was that it stimulated discussion on what expertise was needed for WFD implementation, what was available, the quality of available expertise and the need to develop more. It also demonstrated that there is a need for such an instrument. Many specialists would like to have a tool for analysing water quality and the effect of measures on ecology. National level policy makers would want those specialists to use an instrument that provides a common knowledge base, contributing in this way to standardisation of the policy process. Political decision makers and policy staff would appreciate a communication tool, but as

that would depend on a knowledge base that is accepted by the experts, this will be a possible next step, not the first. At the moment the Explorer is redesigned mainly as an instrument for specialists and is expected to be available for the next round of development of RBMP's.

Transferability of the WFD Explorer

In principle the transferability of a decision support system such as the WFD Explorer is high. It is "only" software that can be put on any other computer, if the technical requirements are met. It is not necessary to change the institutional setting or write new laws. But for the instrument to be effective a lot more is required.

Organizations that intend to use a tool like the WFD Explorer, need to decide what exactly they want the tool for. The objectives need to be clear and agreed upon. It is also vital to establish who are the intended users within the organization itself. The organization should not be seen as one entity. The producers of information and the users of that information may have different needs. The instrument would need to be adapted to the local situation: different types of water bodies, soils, landscape, aquatic biology. So specific knowledge rules will need to be available or will need to be developed. The same goes for the necessary data, as with all computer models.

Expertise is necessary in many forms: to adapt the instrument to the local conditions and demands, and the skills of the people that use the instrument. The introduction of a sophisticated instrument such as the WFD Explorer requires an investment in time for users to develop the model and to experiment with it. Management would have to support this investment of time and money, realising that the results may be intangible for some time.

As the instrument was never used for its intended purpose, it is impossible to say whether or not it may serve that purpose. But for the same reasons the first WFD Explorer was thought to be a promising innovation. The newly developed Explorer can be called a promising innovation: it can help decision making in choosing measures, by assessing the effect measures will have on the water status. Maybe more so, because a lot has been learned in the process and the expertise base the instrument depends on has grown significantly in the past years.

4 Comparison of case studies along the central challenges

In this chapter, the three case studies are compared along the six central challenges identified in i-Five for the implementation of the WFD: the institutional settings, integration of scales, integration of sectors, local appropriation, public participation and integration of expertise. While the challenges might overlap in some aspects, in each sub-chapter the situations in the different case studies are used in order to illustrate them. For each theme, summarising lessons learnt are included to the benefit for the second implementation cycle of the WDF.

As already elaborated in the inception report (Mostert et al. 2009) the aim of the i-Five project is to support the implementation of the WFD by promoting the transboundary exchange of experiences, by broadening the range of methods and tools available to water managers (the i-3's) and by helping them to develop the best approach for their own situation. This includes comparing the different experiences and i-3s along a common research frame. In this, the identification of central themes formed part of a flexible and reflexive research design, in which theory and practice inform each other (cf. Kolb, 1984) and in which the researchers and other stakeholders mix.
The central themes (see Table 1) have been identified as central challenges for implementing the WFD by the researchers only. However, they were confirmed through discussions at e.g. the first international stakeholder workshop of i-Five in Hannover (January 2009).
In the following, each topic will be introduced with its central challenges. Then, the main issues of the three case studies will be presented, summarised in lessons learnt for the second WFD implementation cycle.

4.1 Institutional challenges for the transposition of the WFD

For implementing the WFD, member states were required to organise themselves in a suitable manner. They needed to identify one or more formally competent authorities for the different river basins in their territory. It was obvious, however, that these authorities would need to coordinate and cooperate with many other authorities since they could neither be competent in all fields and on all issues that are relevant for implementing the WFD, nor could they possess all the necessary information and funds. Thus, working structures were required for the different authorities and other stakeholders to cooperate effectively. Moreover, tasks and competencies needed to be agreed upon and procedures were required that are clear and flexible enough to cope with new developments.
The member states and regional organisations built their approach towards river basin management on the existing institutional settings. No fundamental changes were introduced in terms of division of competencies or organisational settings. If a new organisation at river basin scale was introduced, it had generally mainly coordinating competencies. As a consequence, many different interpretations of what was required and appropriate to the regional specificities emerged. Comparisons are therefore difficult to make because existing settings differed a lot: competencies and functions are distributed very differently in the three cases. Thanks to the interaction with stakeholders of the three cases—notably during our international seminars—we understood better which organisations perform similar roles required by the WFD. Table 1 compares the institutional settings in the three basins.

In this section, we use the comparison of the three case studies of the i-Five project to identify contextual evolutions which shape how institutions in the different basins adapted to the introduction of the WFD. Then we focus on the variety of water management settings inherited from the past and how this may help or hamper the WFD implementation.

Role in implementing the WFD	Thau in France	Lower Saxony in Germany	Brabantse Delta in the Netherlands
Competent authorities	Prefect, river basin coordinator (préfet coordonnateur de bassin)	Ministry of Environment (MU) supported by NLWKN Municipalities as lower water authorities	At national level: Minister of Transport, Public Works and Water management, Minister of Housing, Spatial Planning and the Environment, Minister of Agriculture, Nature and Food Quality At regional level : councils of provinces At local level : councils of waterboards and municipalities
River basin planning	Water agency and State basin *delegation (delegation de bassin).* The RBMP = SDAGE	A river basin commission as coordinating body for transboundary issues MU/NLWKN > rarely focus on complete river basin district	All competent authorities in different ways. A coordination structure was set up, with commissions at the national and the river basin district level, involving political representatives and staff members.
Organising public participation at national/state level	Ministry of Environment through the Grenelle process (6 months during 2007)	Information provision: - Regional (for advisory council in Lower Saxony ,once to twice a year) - Consultation: formalised process for written consultations, addressing all stakeholders	Consultation: Minister of Transport, Public Works and Water management Active involvement: an existing platform for societal consultation on water related subjects (OWN).
Organising public participation at sub-basin level	Commissions géographiques More locally: SAGE and SAGE commissions	Area Cooperation	Sounding boards at river basin level "Area processes" organised by the waterboards
Implementing measures	Local authorities (maîtres d'ouvrages) and local private water users	Municipalities and Verbände	Municipalities and waterboards, provinces and Rijkswaterstaat
Paying penalties in case of non-compliance and sanctions	The French government. It may turn back to local authorities but this is not decided yet.	The Federal State of Germany (national level). It might then refer to the state which is responsible for the plan or the part of the plan which is questioned.	The Dutch government (In October 2009, an act allowing to pass down the bill to the culprits was submitted to Parliament[8])

Table 1: Typology of organisations playing a role in implementing the WFD in the three cases

[8] Kamerstukken, 31, 257

The big picture beyond water

The requirements of the WFD imposed strong challenges on some of the institutional settings in the case studies. Furthermore, these settings were strongly influenced by political and institutional changes outside the water sector. It is important to stress the significance of such non water-related driving forces, if they exist, before drawing conclusions based on comparisons between water related policies throughout Europe.

For example, WFD implementation in Lower Saxony cannot be understood without referring to the federal structure of Germany and, more locally, the institutional reforms resulting in a complete re-organisation of the regional administrative level. Within the federal structure of Germany, the states have been given responsibility for water management. The institutional structures that have been created hamper an integrated approach of IWRM, due to the decentralised structure and limited requirement of coordination. However, in March 2010, new federal legislation for water resources management has come into force (after the case study). Now the national regulations such as the Federal Water Law (WHG) may overrule regulations at state level.

In order to reduce public expenses the administrative reform in Lower Saxony has affected personal resources. For example, environmental policies were severely affected by job suppressions, notably in water management and nature conservation. The NLWKN, the agency responsible for implementing the WFD, experienced a reduction of work force in the area of nature conservation of –39 % and within water management of –25 %. Municipalities were given former state prerogatives together with the corresponding policy budget, but they hardly had budgeted for qualified personnel to handle these new tasks.

France and the Netherlands did not experience similar reforms during the implementation of the WFD. Yet, in France local authorities are targeted for a possible reform. Within this context, the local authorities are reluctant to commit themselves to the programme of measures. The reform could largely modify local authorities' budgets and competencies. Notably, the possibility for Départements and Régions to fund water projects might be challenged.

Choosing the best measures

The WFD asks member states to characterise the current environmental status of water bodies and to identify the gap between the actual state and the good status. Member states have to draft measures to bridge this gap, and select the most cost-effective set of measures to meet the goal. Such optimisation within the water-sector does not take into account the possible benefits of measures that may extend beyond their effect on water. When performed by water-related experts, optimisation might discard integrated measures which may be sub-optimal for water, but could be very efficient from a more general point of view. The WFD though may allow integrated measures. In the case-studies, we observed that integrated measures need specific justification and support from coordinating institutions because they may rank poorly on water-related indicators.

The environmental objectives of the WFD in Thau for example require that nitrates and phosphorus are below a certain threshold. This is currently achieved by oyster production. Indeed, exporting shellfish is chemically equivalent to treating phosphorus and nitrates by tertiary treatment. From an N/P point of view, shellfish production is equivalent to a sewage treatment plant. To achieve the good ecological status Thau may either sustain oyster production or accept letting the oyster production go down (as it is threatened by high mortality of larvae now) and instead build a series of sewage treatment plants. However, oyster production has directed the economy of the area for the past twenty years; it has imposed restriction on tourism infrastructures (marinas are forbidden because of oyster production). It relates to how people feel about the area they live in. It keeps away urban sprawl, which otherwise would induce more pollution. Thus, oyster production has many benefits for the area, in an integrative way. It is expected that many local measures may have implications locally that cannot be grasped by their calculated effect on environmental objectives in 2015.

Overview of financial aspects

The WFD Art. 9 requires taking into account the principle of recovery of water services' costs, , including environmental and resource costs. This relates to the economic analysis, conducted according to Annex III and in accordance in particular with the polluter-pays-principle. These issues presented major challenges to the member states and were in general poorly implemented. However, the factual costs and their coverage were central issues during the development of the programme of measures in the case studies.

In France, water agencies raise water taxes. Between January 2007 and December 2012, the water taxes will have amounted to 11.6 billion Euros for the whole country. This sum complemented by cross-funding from water services, local authorities, Régions and Départements, is expected to cover the cost of the WFD implementation. Water agencies allocate subsidies to projects according to a 5-year programme approved by the Comité de Bassin and the national Parliament. This programme will become the Programme of Measures according to the WFD. It includes investments to comply with the urban waste water directive, but goes much further.

In the Rhône Méditerranée district, the water taxes and the complementary cross-funding amount to 4 billion Euro yearly, paid by the State, local authorities, farmers, industrials and consumers. It is supposed to increase by 10% in the coming years to meet the WFD objectives.

In Lower Saxony, the Ministry of Environment has identified a strong need for subsidies since only about 5% of the total expected expenditures for the WFD will be covered by taxes and other income sources. The funding problems led to much scepticism among the stakeholders regarding the planning and implementation of measures. However, the resulting need for external funding is by now covered in principle.

In the Netherlands, most costs for the implementation of the WFD will have to be borne by Rijkswaterstaat (the State water management agency) and the waterboards. Rijkswaterstaat spends annually around € 1.2 billion on state waters, mostly coming from the national budget. The waterboards spend 1.1 billion for wastewater treatment and 1 billion on the management of the regional water systems, paid for by the water users through waterboard taxes. There are hardly any separate funds for implementing the WFD: measures will be funded through the regular budget of Rijkswaterstaat and the waterboards, which may increase a few percent to fund additional measures. For the waterboards this means they will have to raise taxes. The investments needed for implementing the WFD have been estimated at 2.2 billion until 2015 and 2 billion after 2015.

It has proven difficult to compare the workforce dedicated to the implementation of the WFD in each case. In France and Germany, interviewees agreed that the budget for the required personnel would not exist, if it had to be covered exclusively by the local water users. In France, the costs are largely covered by water users in the whole basin, through the water agency. In Germany the state and municipalities cover the costs. In the Netherlands, wages of the personnel implementing the WFD are covered by the regular taxes, paid to the waterboard or paid to the central government and then redirected to the national water management agency. Water users are mainly aware of the implementation of policy and much less of the proceeding planning process and will usually not be aware that they pay for that process as well.

Seizing the WFD opportunity

As previously stated the WFD did not succeed in modifying the whole organisation of water management in the cases we studied. A few organisations were created for the purpose of the WFD (ONEMA in France, coordinating river basin commissions in Germany and the Netherlands). The WFD created a window of opportunity for some organisations and their leaders to expand their scope of activities, notably by sometimes setting up experimental procedures or projects.

This was certainly the case in the Thau basin where water really matters. This can be explained as a long State tradition in which water is seen as a key issue and is strongly linked to State sovereignty. In France, the State strongly influenced the boundaries of local water institutions. The boundaries of local water management plans (SAGE) are pre-identified in basin plans which are

approved by the state (SDAGE). Water agencies allocate subsidies to support stewardship at SAGE level.

In the Netherlands, effective water management, especially drainage and flood protection, has been a precondition for the country itself. Later water quality and ecology were added to the waterboards' tasks. The staff of the waterboard Brabantse Delta is open to new developments and is supported in this by the Dijkgraaf. Apart from this, the WFD has been used by representatives of some waterboards as an argument in favour of keeping to the independence of the waterboards (e.g. Havekes 2008).

Leaders and laggards in reference to previous water directives

National compliance with previous European water-related directives has certainly set the scene for debates concerning the implementation of the WFD and related institutional changes. These debates in turn have framed goal setting for the WFD. Neither France, Germany, nor the Netherlands, initially complied with the Nitrates directive (91/676/EEC). Moreover, France did not fully comply with the Urban Waste Water directive. (91/271/ EEC)

In the Netherlands, the implementation of the WFD has been intensely debated following the publication of the study called Aquarein (Bolt et al. 2003). This study, requested by the Ministry of Agriculture, Nature and Food Safety and performed by Alterra, a research institute linked to this Ministry, explored the consequences of setting good ecological status objectives for all waters in relation to agriculture. The report suggested that it might be necessary to reduce the agricultural area by two thirds, given the significance of intensive farming in the country, to comply with WFD. Even so, in some areas it would probably be impossible to reach a good ecological state because of the time-lag in releasing chemical substances that have accumulated in the soil. The study caused a lot of debating. Farmers associations were highly concerned about the possible impact of WFD on their livelihood. The debate delayed the transposition of the WFD into domestic law. Moreover it framed (lowered) the ambition level of the WFD implementation. As a response to the discontent caused by the Aquarein study, the deputy minister of V&W issued a brief summarising to the Cabinets' view on the WFD implementation. It stated that current land usage would not be challenged. A new manure law was at the time being developed to comply with the Nitrates Directive, given the pending infringement procedure against the Netherlands. The brief stated that No extra restrictions on behalf of the WFD would be included in the manure law (Staatssecretaris van Verkeer en Waterstaat 2004).

Pending infringement procedures also framed the implementation of the WFD in France. France did not comply with two water-related EU regulations, the nitrates directive and the urban waste water directive. Indeed, groundwater in Brittany exceeds nitrates guiding values. Moreover, large cities on the Riviera did not upgrade their sewage treatment plants as required and France was late in adequately designating areas prone to eutrophication around Paris. Concerns about possible penalties justified the creation of ONEMA in order to avoid further litigations caused by a lack of domestic coordination. Germany and the Netherlands already complied with the Urban Waste Water Directive and did not face the same need of centralising information about municipal equipment.

Implementation of former directives in other domains than water also influenced the process. The European framework directive on air quality (96/62/EC) was taken very seriously in the Netherlands and resulted in many constraints on land planning. During the selection of measures for the WFD local actors often mentioned this experience to justify their reluctance to list measures in binding documents, although they were willing to implement them. They preferred to keep them out of the plan to avoid litigations in case of unexpected delays.

With regards to this background, the experience with the implementation of other European Directives increased the pressure for compliance. German water managers as well as agricultural stakeholders were concerned not to repeat earlier mistakes (e.g. during the implementation from the FFH directive). In addition, the earlier experiences did also add to the perception of the WFD as an overall European demand. Although the responsibility of complying with the WFD lies with

the member states, this pressure was forwarded to the lower level. This can already be perceived as a barrier for the local appropriation—because it implies a lack of national and regional ownership of the WFD if the reference is still to the European level instead of to their own competences.

Debates about fit or misfit

Many scholars consider that domestic institutional changes are driven by misfit between EU requirements and national settings (Cowles, Caporaso et al. 2001; Tsebelis 2002). Pre-existing or not pre-existing river basin organisations have therefore often been in the focus of attention (Jaspers 2003; Moss 2004). From this perspective, we expected that The Netherlands and Germany would have had a harder time with WFD implementation than France where organisation by watershed already existed.

However our case-studies show it is less the existence of river basin organisations but the correspondence of organisations involved in selecting measures and those implementing them which is far more crucial. In France, water agencies are not responsible for implementing water projects, but only to fund those initiated by local authorities (collectivités locales maîtres d'ouvrages). This sometimes resulted in a lot of uncertainty whether measures were implemented or not. In the Netherlands organisations in charge of implementing measures (especially waterboards) were heavily involved in setting objectives and developing the programme of measures. This in turn, often resulted in more precautions in choosing measures to avoid binding commitments. As a consequence the criteria listed in the programme of measures are expected to be implemented. In Lower Saxony, local authorities collaborated through the Area Cooperations in order to define and select measures. Some stakeholders perceived this process as not transparent. At the same time, lack of coordination at higher levels (the river basin, Germany as a whole) and/or a lacking a clear common framework on these issues restricted the outcome of local process. Standardisation processes at state level that were insufficiently transparent regarding the content of this process, resulted in a lack of understanding for decisions. So although the local level was involved in the process of selecting measures, it is doubtful that they will support the implementation of the programme of measures.

Lessons learnt for the second implementation cycle

Although we cannot recommend a specific institutional setting that seems to function better than others for implementing the WFD we want to point out specific aspects which seem to foster river basin management.

Coordination is the key in all cases. As said before, no organisation can achieve the WFD objectives alone. For the time of our observations we did not notice that new dedicated institutions for coordination had been more effective in practice than informal coordination that was set up by older institutions. We observed effective coordination between institutions and scales in the Netherlands which has a long tradition on consensus and long established institutions for water planning. This coordination was formalised in a commission that had no authority to make decisions. In Germany coordination was organised by new working area-level institutions. These faced more difficulties in relation toactors in charge of implementing measures, because they were involved but did not feel they were taken seriously sufficiently. New organisational settings at national level in France (ONEMA, Grenelle process) faced the problem that they could develop a programme of measures, but could not enforce the actual implementation of this programme as other organisations are responsible for funding or implementing measures. Coordination at basin-level and national level is important to ensure a coherent and effective programme of measures. Still, the key to the implementation of the WFD is not so much the existence of basin-level organisations but awareness of the necessity of a river basin approach as well as a correspondence between institutions in charge of planning measures and the ones in charge of implementing them.

Organisations that were not fully involved in the planning process cannot be expected to enthusiastically implement the plan and/or pay for the implementing.

4.2 Coordination across scales

As mentioned in the inception report of i-Five, integrated water management requires complex coordination across scales, including planning activities and thus can offer classical examples of multi level governance of natural resources. In this section we focus mainly on scale issues regarding the decision-making process, even though coordination across scales is also central to other themes, such as stakeholder participation. The basic assumption is that a practical and effective moving between scales is needed in order to combine a harmonic approach throughout the river basin, with the actual implementation of measures.

The details of such moving between scales differ from country to country and even basin to basin.

Existing institutions frame scale issues

Where the approach to water management and the corresponding institutional structures were not based on the river basin approach (as in Germany and the Netherlands), the solution to the institutional requirements of the WFD was not the creation of new competent authorities, but actually utilising those existing. Although this was considered by the water authorities a pragmatic and efficient approach to retain a stable system, while complying with the WFD, additional coordination challenges were created that were quite time- and resource-intensive. Additional coordination requirements always include the risks of increased costs but also a loss of transparency for the stakeholder, thus reducing their involvement. However, if applied successfully it might also promote a better implementation of the WFD in a technical sense: the aim of sustainable water resources management as a shared interest may be supported better by different scales if their competences and responsibilities are not at stake.

How successful this coordination is, seems to depend on the institutional context. The Netherlands are an example in which the current institutional system seems to be able to cope with the challenges set by the WFD in a way that no fundamental changes are needed for the next implementation cycles. The integration of the different scales seem to work better where the approach has been explicit and “well tuned”/well-functioning (Netherlands), where the national level takes a guiding role, supporting the bottom-up approach. In Germany, the coordination approach is often criticised for being too complex and fragmented. Harmonisation between the different states is hampered by regional interests and a lack of river basin approach in the states’ water management strategies. This may change with the implementation of the new water law, which not only sets the general framework, but also provides the federal level with the competency to enact federal by-laws. In France, while the stronger emphasis on sector integration and cost-effectiveness has increased the complexity of water management for the Water Agencies, the process of setting up basin-oriented management structure already started in France 30 years ago and is rather advanced.

What needs to be balanced here are the downsides of a complete change in institutional structures (additional costs, political hesitations, a long and probably inefficient transitional period and uncertainty of the final result) versus the advantages of creating or reforming the coordinating structures in a transparent way. The latter may even support the understanding of stakeholders because the specific allocation of tasks may become less important. Thus, they only need to address one contact point which is sufficiently informed on cross-compliance issues for comprehensive support. In the Netherlands changing the institutional setting is feared to lead to prolonged competence struggles as a top-down decision of these changed will certainly be challenged.

In countries such as France the long established river basin approach to water resources water

management allowed to build on, and further develop, already existing river basin oriented structures. However, local concerns in France were rather similar to the other cases, in terms of having to implement measures which are not of local interest. Local organisations were not involved in the planning process at the river basin level. The benefits of measures they are asked to take may lie at the river basin level only, thus increasing the feeling that implementing this new EU regulation does not lie within their responsibility. It seemed, however, that Mayors there were more easily convinced to enact their competencies and responsibilities than in Lower Saxony, where financial issues and resulting responsibilities played a central role in the lack of trust in the implementation process at local level.

Balancing top-down and bottom up approaches

The WFD is the first directive which is not only legally imposed "top-down" on the member states but at the same time accompanied with a Common Implementation Strategy, developed as a cooperation of all member states, to provide guidance to the different national processes. In addition, many member states have developed "top-down" guidance, either at the state or regional level (for Germany the states) in order to provide the necessary top-down harmonisation/common approach needed for a river-basin approach. However, this top-down approach needs to be complemented with bottom-up approaches, feeding local/regional expertise and interests into the implementation process and streamlining the established approach to water resources management towards one complying with the WFD. The influence of these two different directions differs between the case studies.

Not surprisingly, it seems that centralised, river basin oriented member states have functioned more "top-down" (as e.g. France), while more federal or decentralised countries have seen a more "bottom-up" approach (as e.g. Germany and the Netherlands). This stronger "bottom-up" element can support integration of local knowledge, raise acceptance and appropriation at the local level. However, if there is a lack of top-level guidance, local interests might lower the level of ambition and the interpretation of the main elements of the directive (e.g. assessment of exemptions) in order to avoid an arbitrary setting of the ambition level or selection of measures. Still, while France in general is a centralised country with many top-down procedures, in some basins (e.g. the Rhône Méditerranée) the bottom-up element was a very strong one, i.e. the local actors put strong emphasis on keeping to their competencies. In the Netherlands the two processes were linked by having the local level propose measures to include in the river basin management plan: at this level coordination and harmonisation of local plans took place. It is important to note here, that having guidance, mostly on the level of ambition and the methodologies to be used, needs to be followed by appropriate funding for the local level so that it can perform its duties. The provision of general guidance or setting overall ambition levels and approaches was late in all case studies. This created difficulties in having truly integrated and coherent results for the Programme of Measures and the RBMP. These delays can be partly explained by the very tight timeline of the WFD for the first implementation cycle and could be corrected for the upcoming cycles if addressed early enough. However, it seems that valuable time was sometimes lost early in the process (e.g. in the first years after the introduction of the WFD not too much happened in the Netherlands).

Financing across scales as an important precondition to good water management?

Regarding financing, the final implementation of measures in its majority resorts to the local level (Germany, France, Netherlands), but funding of measures may resort to a different level.

The RBMP so far are not always very specific on the financing side. They often refer to existing financing structures, while the actual specification of the measures and clarifying its financing will take place within the 2010-2012 period. A certain movement regarding financing away from the local level to a more centralised approach can be observed in the French case study, but it has to be seen if this development is really linked to the WFD-implementation. It might be "systematic", in a sense that certain measures need to be taken at the river basin or higher spatial level, so financing has to follow, or it might be a specific and more singular development.

The coordination between basin level or higher administrative levels (in charge of “command and control”, large scale planning and relevant financing), and the local levels (in charge of implementing water policies and smaller scale planning), is a major issue for the implementation of the WFD everywhere. In France, the autonomy of the local level requires that taking measures is voluntary. Incentives from the higher level are needed for the local level to actually perform these measures. Local organisations in France and Germany can apply for funding from organisations at higher levels that may have been involved in the planning process itself, but may also not have been involved. The local organisations will need to pay part of the measures themselves. Where exactly funds can be acquired is not always transparent to the local water managers. The complexity and uncertainty of funding requires a high motivation of the implementers to act. Thus, mainly municipalities which have already identified their interests in or benefits of implementing measures will implement them imminently.

Waterboards in the Netherlands are required to implement the WFD, but the type and the amount of measures lies within their own responsibility. Similar to the other case studies, most costs will be at the local level in the Netherlands: the waterboards and, to a lesser extent, municipalities. The measures directly linked to the main rivers will be covered by the national level. The programme of measures is put down in the various plans, confirmed by the councils of the waterboards and municipalities. It is legally required to implement them ultimately in 2012. The measures are committed to—and will mainly be implemented by—using their own funds. Coordination of the actual implementation lies with the local partners, e.g. land owners, or environmental organisations that are affected. The coordination across scales was done during the planning phase and will be less prominent in the implementation phase.

In most cases the cost-effectiveness of measures was not assessed at the river basin level. Measures in the Netherlands, for example, were mainly developed by waterboards and were mostly judged on the feasibility of their implementation. It is possible that certain measures at river basin or national level would have been more cost-effective but this was not looked upon.

Lessons learnt for the 2nd cycle

The present institutional setting may hinder implementing a river basin approach. Changing the setting to facilitate this approach may have serious disadvantages that need to be considered. Adding an extra coordination institution may complicate the coordination across scales, but this may still be more effective that overturning the present arrangement. Many measures will in any case need to be implemented at a local level, so having the right combination of partners involved, at local and river basin level, is vital.

A delicate balance between top-down and bottom-up processes needs to ensure that the local interests are well represented and support for the measures is provided. At the same time issues at the river basin level should also be dealt with in an effective and transparent way. Measures should reflect both levels to effectively improve the water status of all water bodies in the river basin. While one needs to keep in mind the institutional diversity regarding water management across Europe and even within member states, the cases show that constraints in the river basin perspective can lead to measures that may not be the most cost-effective. The largest part of measures related to the WFD will be linked to second order, or smaller waters. Water managers need to acknowledge the river basin perspective more, especially in Germany, so that water management measures are selected

The coordination across scales is also central for matching the funding of measures. Here, the “top-down” and “bottom-up” process need to interact to identify the appropriate level for funding and to ensure that the organisations required to implement measures are not hindered by insufficient means, or complex procedures to apply for funding.

4.3 Integration between sectors

The status of water bodies is often affected by policy sectors and activities beyond the scope of water management policies. Achieving good water status implies commitment from more than the water sector. It requires integration between sectors so that water planning is also taken into account by stakeholders whose relationship to water is not direct.
In the three cases, agriculture and spatial planning are acknowledged as key sectors to involve in the planning process to avoid discrepancies between water management and land usage practice affecting water. Moreover risk management (e.g. on floods) is an important policy to streamline with water management. Coastal erosion and coastal flooding have loomed large in land-use planning in the Thau case. Flood risk was mentioned several times in the German case study (especially as an opportunity to get some spaces to implement WFD measures). In addition, in the French case, tourism and fishing activities are central for the future of water management.
One interesting question raised by the WFD was the impact of the binding objectives on previously approved plans. In order to meet the environmental objectives many sector-based policies and plans may have to be modified. After presenting how context matters, we address this question in the second sub-section. Then we deal with uncertainties and the timeframe as possible limitations for integration.

To what extent does context matter?

a) Conflicting views
Integration consists of taking into account different objectives which may be at odds with each other. To value water quality as much as market commodities production, challenges include the dominance of the ideal of global competition in favour of more sustainable development. The case-studies in Germany and the Netherlands reveal that profitability of agriculture looms large vis-a-vis environmental concerns related to the WFD. Farmers organisations in the Netherlands argued successfully that more stringent limitations on manure use in the Netherlands would disrupt the level playing field for agricultural production in Europe. In Germany additional costs for farmers to compensate for the diffuse pollution caused by agricultural practise have hardly been discussed. The case in Thau is quite different (although not representative of all cases in France) in that oyster production is the flagship production of the area, while oysters also purify the water.

b) Lack of technical integration at national and European levels
The lack of integration of public policies at higher levels influences integration at local level. At the European level, the Common Agricultural Policy structurally encourages intensive production, at the expense of water quality protection, despite the provisions of European directives such as WFD, Natura 2000 and the Nitrates Directive. Contradictions between such policy sectors at European level result in contradictions at national, regional or local level, all the more since the timelines of negotiation and implementation of such policies are different.
State governments are sometimes able to overcome such contradictions. The LAWA in Germany issued guidance documents facilitating integration between Natura 2000, WFD and flood risks. However this requires time and they were not available on time at state level; in addition, such guidance is legally not binding for the different states.
How competences that are already allocated among ministries leads to some kind of integration within each institution. Other processes are nevertheless useful to coordinate policy sectors. In the Netherlands three ministries are competent authorities under the WFD (V&W, LNV, and VROM). Moreover an inter-ministry coordination was set up for water, which also includes representatives of decentralised governments (provinces, municipalities and waterboards). In Germany a working group was set up between ministries. In France, local state offices at departmental level have been merged to gather agricultural services, infrastructures development and spatial planning. This

fosters capacity building in a larger domain of expertise, more adapted to sustainable management.
The three cases show that different intermediate levels further support integration by making cross-sector information available. Provinces in the Netherlands perform as coordinators for planning activities dealing with water, environment and spatial planning, but their regulatory powers are limited and they usually do not implement measures. In France, regional planning documents such as the region development plan (SRADDT, Schéma Régional d'Aménagement et de Développement du Territoire) or the regional strategy for biodiversity, or local agendas 21 (action plans based on sustainable development principles) take over this role. The NLWKN in Lower Saxony also contributes to integrating policies. However the coordination endeavour at this level does not dictate water management at a lower scale.
At local scale situations are more diverse. Lower Saxony's Area Cooperations have little staff and expertise and no legal mandate to support the local actors; Dutch waterboards benefit from both expertise and a longstanding water management culture; in SMBT, the French local authority of Thau, expertise and coordination between land-planning and water are available, but such a situation is not the rule in the rest of the country.
Integration at higher level facilitates integration locally. Without this support, the local level is less likely to integrate inconsistent policies.

c) Cultural factors
Integration between sectors depends on people or structures that connect the sectors and trans-boundary activities. Such settings are encouraged by European legislation on public participation and publication of environmental information. However, even those settings may bring people together. One factor fostering the success, is the cultural context. For example, the so-called "consensus culture" in the Netherlands goes along with high professionalisation of mediation skills. It often prevents disruptive conflicts, but decision-making is a long process and the outcome is often a compromise respecting everybodys' independence rather than an integrative solution. The context is much more diverse in France. Nevertheless, as more local authorities develop projects for their territories, they also contribute to inter-sector policies through vision-building.

d) Biophysical, geographical and economic context
For implementing buffer zones, providing space for water retention or river development, land is central. The availability of undeveloped land is very different in the three cases. In some cases, particular activities have long shaped the landscape. Their path-dependency restricts the range of possible future scenarios which can be negotiated among sectors.
Little undeveloped space is available in the Netherlands. This induces a strong constraint on water management and makes re-naturalisation of water course almost impossible.
In Germany measures are easier to implement on public land or protected areas than on private land where agriculture prevails.
In the Thau basin, the wine crisis makes agriculture less powerful to influence the future. Deindustrialisation and promotion of traditional activities also give more opportunity for natural restoration. This results from the role of the State in the recent history of this area. Local authorities are expected to become larger and more powerful, and the new public management doctrine tends to limit state intervention. As a consequence the level of priority that will be given to water issues by these local authorities in their strategic development plans will determine whether WFD will be implemented successfully.

How policy instruments[9] support integration

[9] Policy instruments are all legal or contractual documents used to implement a policy.

The WFD requires member states to reconsider priorities between policy sectors. Before the transcription of the WFD in French law, spatial-planning documents (SCOT and PLU) had a higher binding character than water-related documents (water management plans, SDAGE and SAGE). The first transcription of the WFD into the French water law in 2004[10], changed this order, holding that SCOT should comply with SDAGE and SAGE. Government officials interviewed thought it would strengthen the power of actors protecting water quality. However, the professional routines of spatial planners and the democratic legitimacy of local decision makers in France are still dominated by an urban and economic view of local development. Ecological considerations are still limited and the Thau territory remains an exception due to its economy based on water quality.
At local level it was also observed that the stronger binding character of SAGE tends to discourage stakeholders to use this instrument for planning and ruling water management. Instead of less provisions being included.
The same rationale was looked upon in the Brabantse Delta where municipalities were in some cases willing to implement measures, but reluctant to inscribe them in the programme of measures due to its binding character. In conclusion, stronger instruments do not automatically lead to higher objectives. The environmental objectives of the WFD are merely binding for the water plans, which contain measures that have to be implemented by the latest in 2012. Links with spatial planning and agricultural policy are much weaker, which obviously limits cross-sectoral integration.

Limits to integration by uncertainties and time-frame

In all cases, limited knowledge and data was available to sufficiently answer questions raised by the WFD about the relative efficacy of measures and the achievement of good ecological status. Despite a very intensive multi-experts process to develop the WFD Explorer this can even be said for the Netherlands . The Dutch case study also demonstrated the difficulties to integrate data and expertise between sectors, not only because of the complexity of the phenomena, but also for strategic sectoral reasons, as demonstrated by the development of different tools for different policy fields. Part of this uncertainty can be considered systemic. River basins as complex socio-ecological systems are unlikely to be understood fully. Combined with financial sources of uncertainties (see above), the “optimal integrated measures” cannot be identified.

The schedule of the WFD does not leave much time for integration. Moreover, previous experiences of negotiations for the implementation of EU directives influence the way in which the WFD is perceived today. However, the different timelines imposed by other policy sectors may provide windows of opportunity such as the designation of new Natura 2000 sites, designation of flood-prone areas, as it was mentioned in the German and French case studies. Only actors with a large scope of action and integration capacities will be able to seize such opportunities—or actors that cooperate very well, better than is usually the case at present.

Lessons learnt for the second implementation cycle

Integration between sectors has to be considered as a multi-level issue (European, national, regional and local). Lack of integration at a higher level will result in inconsistent policies that will be hard, if not impossible, to integrate at a local level. The current Common Agricultural Policy remains a major barrier for the implementation of the WFD, while other policies may, or may not, provide opportunities (e.g. Natura 2000 network, flood risk management). At local level, municipalities may be reluctant to inscribe measures related to the WFD in their water plans because of the binding character of the programme of measures and the uncertainty of their ecological and financial impact. As said in 4.1, national and local contexts are complex and dynamic and can provide specific spatial and temporal windows of opportunity to implement cross-sectoral approaches that include WFD measures. In order to grasp these opportunities ad-hoc

[10] Law 2004-388 of April 21th, 2004

settings for coordination between sectors are needed. Flexibility in people and institutions are required and the capacity to work in such a way would need to be increased. Highly skilled mediators appear to be key persons for enhancing the circulation of information and to mobilise expertise and innovation in order to build a vision of integration. Our case studies analysis has also clearly demonstrated that there is still limited available scientific knowledge and data to properly answer ecological and economic questions raised by a cross-sectoral approach. Research and transfer efforts have to be pursued in that direction. Due to the very tight schedule of the WFD, guidance documents and cross-sectoral expertise will need to be available in time to have the chance to influence local planning and development practices.

4.4 Public Participation

Organising public participation as required by the WFD implementation has been identified as one of the central challenges to the water authorities (linked to Art. 14, WFD). Public participation can potentially improve the support for governmental water resources management, especially with regard to measures (e.g. in terms of resources and their implementation). Moreover, successful participatory processes enable learning among stakeholders and promote innovation. In addition, public participation can facilitate the integration of sectors, scales or of external expertise (see Inception Report and the relevant chapters of this report). However, water authorities had little experience in setting up participatory processes. Facing the content and process of the WFD also for the first time, water managers often had to learn about technical water issues or procedures at the same time or only just before the stakeholders were informed. In addition, they had to be sufficiently transparent for appropriately managing stakeholders' expectations and involving them, while both water authorities and (organised) stakeholders were until then far more used to formalised, written and mostly bi-lateral interaction. In this sense, the challenges related to public participation for implementing the WFD were huge and constantly shadowed by the other technical and procedural requirements.

Active involvement—best at local level?

While consultation procedures have been explicitly described in Art. 14 of the WFD, active involvement is only to be encouraged. Its implementation thus leaves space for different approaches. In the case-study regions this is reflected in the different ways in which organised stakeholders are invited to contribute to the implementation process. In general, the more local the scale, the more active it was.

In France, local water committees (CLE and informal commissions associated to the CLE) strongly influenced the decision making process on measures and objectives (although implementing measures mostly remained the responsibility of mayors and water users). Multi-stakeholder meetings at higher level (e.g. national) often more functioned in terms of information or consultation. Integration of the different interests and feedback to the stakeholders were less direct through multi-stakeholder platforms but more so through the role of the “animateur” who cooperated with all parties in the process.

In Germany, Area Cooperations provided a systematic approach for involving local and regional representatives in multi-stakeholder settings of water management all over Lower Saxony for the first time. However, this posed many challenges for both stakeholders and the initiating water authorities. The position of the Area Cooperations between local and state level, and their lack of decision-making powers, made it difficult to actually support and influence the often locally required implementation of measures. This has been even more the case since where there was a lack of coordination mechanisms within the different stakeholder groups that would ensure not only the dissemination of information, but also the discussion of important water issues within a broader group. Examples of pilot project boards in Lower Saxony showed that this involvement of broader

groups was easier to handle on a local level. In addition, on local level it was also easier for stakeholders to appreciate specific local approaches while heterogeneity at regional or higher level was perceived more as a threat to sound WFD implementation.
In the Dutch case, a more established culture of active stakeholder involvement was observed. For example, several workshops at different levels took place—also in contexts other than water management. These workshops were basically designed for stakeholders to gain information on and learn about specific issues, but also for the decision making body to learn about the different stakeholder interests and partly for all to jointly find solutions. Interestingly, the Dutch case study is the only one that reports about a written comment during the WFD consultation process that actually led to a change in the plan. Yet, in many other cases stakeholders were disappointed because they could not find the issues they raised reflected in the plans.
Thus, it seems that active involvement as a means to integrate stakeholders' interests into the water management process needs a well established feedback process to acknowledge the stakeholders' input. In addition, efforts are necessary to ensure that the stakeholder groups are involved in the process and not only their representatives. Their expectations are to be transparently managed and adapted, especially if the involvement takes place at a more coordinating or policy making level.

Participatory processes as means to motivate municipalities

Another striking issue was that in all case studies the participatory activities were also initiated to motivate and activate at a local level, i.e. the municipalities as governmental actors, to appropriately support the implementation of measures. Therefore the representatives often responded to this special role of the municipalities in defending their resources. This is reflected for example in the French case. In the affirmation by the initiators of the participatory processes that the Mayor of the municipality kept his or her decision making competence was regardless of any outcomes of participatory processes. Mayors should not feel threatened by such a process. Instead, it shows that a strong driver to initiate public participation in water management is now the lack of resources (and competence/ power) at higher levels to implement all required measures for compliance with the WFD. Again, intermediaries such as water ambassadors or "animateurs" can play a valuable role in this respect.
Additionally, involving stakeholders at regional/local level—and having a rather decentralised approach for this as in Lower Saxony—points out the need for a clear framework on what is expected,what methodologies should be used regarding the setting of objectives ("level of ambition") and/or the selection of measures. This could help to avoid too much diversity and at the same time support harmonisation from a coordinating, "higher" level (river basin, federal state). The current implementation has shown that processes too strongly driven by feasibility creating the risk of not fully supporting the WFD-objectives. In addition, in the German case study the unclear way the proposals of measures which were developed "bottom-up" and then later aggregated at a higher level created confusion and frustration at the lower levels, causing a significant threat to the success of the Area Cooperations.
It is of central importance that participatory tools become not an end in themselves, aiming only at complying with the participation requirements of the respective directive (such as the WFD). Instead, participatory processes need to support social learning, i.e. they need to be designed to allow an open discussion on resources, means, interests and positions. In practice, participation of organised stakeholders is also confronted with the stakeholders' concern that the (higher) water authorities want to impose their duties on them (without providing resources or space for adaptability). With the number of deadlines to meet and new concepts to be implemented during the first implementation cycle of the WFD, the situation was even more pressured. However, if the participatory approaches are continued, it should be expected that for the second cycle more space for true participation and learning processes will be available.

Involving stakeholders with different backgrounds

In an attempt to cover the broad range of (potential) stakeholders in water management, the authors of Art. 14 refer to “interested parties” to be informed, consulted and encouraged to become actively involved. This broadness reflects not only in the different kind of interests that the stakeholders represent, but also their different backgrounds: some are experts in (governmental) water management, some are “at home” with administrational procedures and formalities, while for others all, or part of this, is completely new.
As a consequence, strong emphasis was often given in participatory activities to building a basis of fundamental knowledge about the WFD and water management, including issues such as the complex procedural timelines, technical details on monitoring or substances, legal issues on defining environmental objectives and their consequences. In the German case study this led for many participants to an information overload and consequently to an increasing impression of lack of transparency. The same can be said of the Dutch case: both the authorities and the stakeholders involved were swamped by issues of methodology and administration.

Impact on WFD documents

In the case studies, the emphasis in the participatory activities on the reports to be delivered to the EC constrained the potential of the processes. In all case studies, the involved stakeholders could comment as part of the formal consultation process on the WFD reporting documents such as the programme of measures or the plans in which the measures are to be found. In the German case, this made the stakeholders aware of how little their input was reflected upon. It was not always considered that this was due to the high level of aggregation. Instead, it raised questions, if it the stakeholders’ input was considered at all and acted as a threat to trusting the participatory process.

Lessons learnt for the 2nd implementation cycle: Starting a new process of active stakeholder involvement?

Implementing public participation and cooperation needs experience and training. We found confirmation for several of the lessons in the available guidance documents on public participation in relation to the WFD, such as the need to give feedback and management of expectations (CIS 2002, Ridder et al. 2005, Mostert et al. 2007). These documents recommend designing participation processes that are tailored to local circumstances.
In the case studies, a number of such more general issues that have emerged and general principles were observed. More details on these can be found in the full case study reports and in the documents mentioned above.
Summarising, although the lessons learnt on public participation might be familiar to some, we would like to stress the following.
Participatory processes which involve organised stakeholders should be more than a mere implementation of legal requirements. They need the institutional and individual support of the initiating water authorities. That means that water managers need to show and to have convincing interest in the stakeholders’ positions and interest and respecting them as experts and valuable sources of support. This is not only to “keep the stakeholders happy” but also to contain the balance between providing information and getting stakeholders’ input—and at the end of the day gain better management decisions. The results of the Dutch case study seem to indicate that less formalised participation, such as open workshops on specific issues, creates more openness for jointly developing measures and maybe even stimulating resources for implementation.
For the second implementation cycle, such existing (and new) processes should benefit from evaluating and adapting earlier processes in terms of objectives of the processes. A major aspect is the improvement of the feedback mechanisms to the stakeholders, supporting transparency and eventually trust in the process. However, this should not be understood as a call for additional bureaucracy (– read: filling out countless evaluation forms –) but for a stakeholder and water authorities oriented approach—most certainly requiring training and capacity building for the initiating water authorities in the area of facilitation and participatory process design.

4.5 Appropriation of WFD implementation at local scale

The i-Five focus on the local level raises different questions concerning the local context and the local expectations regarding water management and the WFD, the instruments or institutions which are crafted or modified locally, to meet the WFDs' requirements. We have studied the appropriation of the WFD at the local level in order to understand i-3s' conditions of success and failure. However, the size of the area "local" refers to, might be rather different in the different case studies.
Appropriation means, that local authorities or other stakeholders adopt the WFD objectives. In this perspective it means that they are committed in the WFD process and it is sensible for them. This can only happen if processes and planning of measures are also appropriate: if they are suitable, they are adapted to local circumstances.

In the case studies, appropriation became obvious in its strategic dimension and its role for legitimisation. Central challenge of local appropriation from a high level perspective is to specify the WFD requirements in a way which will lead to an uptake of the local level. Vice versa, the local level deals with local appropriation by adopting and adapting requirements according to their local needs and interests. Studying local appropriation thus allows us to assess the result of the interaction of bottom-up and top-down processes.

A lack of local appropriation

In the three cases, the implementation of the WFD was often perceived by stakeholders as a centralised process at odds with their own agenda and capacities (competences, knowledge, finances and available workforce). Although this local gap was sometimes strategically used as a scapegoat to lower the WFD requirements, it was also mentioned by local authorities willing to achieve better water quality.
In the Weser case, farmers compared the WFD implementation to the way in which NATURA 2000 zones had been designated in Lower Saxony. Many farmers and landowners considered the Natura 2000 process to be very unsatisfactory. Their attitude towards measures for implementing the WFD—"another thing coming from Brussels"—was rather cautious.
In 2000, some water actors in France were afraid that a top-down implementation of WFD might sweep away local efforts on implementing integrated water management. These had been initiated under the Water Law of 1992, setting up local planning processes (SAGE).
In the Netherlands, the implementation of the framework directive on air quality raised concerns that the WFD would constrain economic activities too much and would make new developments impossible. To prevent this, the government decided that the WFD objectives would only have to be taken into account in the different water plans and not in spatial plans. These would not affect manure policy.
The challenge of local appropriation is to reconcile the WFD objectives with realistic local possibilities, without straying away from the general objective of improving water quality. Without local involvement measures may not be implemented. The challenge of appropriation is to define local measures which local authorities and stakeholders can accept and manage, because it suits their competences and opportunities for action.

Local appropriation at different scales

Appropriation is a local issue. What is local however can be interpreted in different ways. The size of the area at stake in discussions is significant. Beyond a certain size of the area, people engaged in negotiations are not directly responsible for the projects they discuss. Possible adjustments are

therefore limited. To be able to compare what happened in the different cases it is very important to take into consideration the size of the area.
The Thau basin spreads over 443 km². 130,000 inhabitants (doubled in summer) are taken into consideration. Given the small size of municipalities in France, this area consists of 22 municipalities. It is at this scale that local appropriation takes place, fostered by the animateur of the Thau basin.
The Brabantse Delta area is about four times larger (the Dutch part of the Meuse Basin is even larger, but the BD itself spreads over 1,700 km²). The definition and appropriation of the WFD objectives were initiated by the waterboard. Municipalities were involved by water ambassadors. In most cases they are officials sent by a municipality in the waterboard area. The Association of Dutch Municipalities asked specific civil servants to become coordinating water ambassador for a river basin area. These used their network to find water ambassadors for each waterboard in the area.
In Lower Saxony, the Weser was divided in 34 working areas in which the implementation process was accompanied by 28 Area Cooperations. The Weser basin in Lower Saxony represents 29,500 km². Each working areas has the size of a quarter of the total Thau basin. Although measures were discussed at this level, they did not result in effective local appropriation, especially not by municipalities. Another process initiated through the amended Lower Saxony Water Act of 2007, which was a result of the WFD, allowed the further development of the already existing cooperation between farmers and water utilities or water associations. At this scale, the translation of WFD objectives by the means of locally negotiated contracts seemed to perform effective appropriation.

Local stewardship and mediation

Local appropriation depends particularly on local contexts and initiatives. The case studies provide two examples for i-3s, that could be used to help address this issue: the “animateurs de bassin versant” in the French case and the “water ambassadors” in the Dutch case. The cross case comparison shows the importance of personal commitment of the individuals filling these i-3s to support WFD implementation.
In France, “animateurs” take charge of the sub-basin, often perceiving their responsibilities as a vocation rather than a mere job. They act as mediators, collecting peoples’ opinions and reformulating them in adequate ways. But they also have to deal with personalities and fragile compromises. They need to express sympathy towards members of the water community they intend to build and towards the environment itself. Animateurs communicate to build a common ground and to promote a public interest in basins, taking local claims into consideration (Richard-Ferroudji 2008).
In Brabantse Delta, water ambassadors act as mediators between municipalities and waterboards. Their role is not to provide expertise or facilitate the process, but to establish a more personal link in order to promote awareness about the WFD in municipalities. The success of this intermediary role is obvious since it has been extended to sewerage management and Delta ambassadors now have been appointed to support the implementation of the Dutch Delta programme. Perhaps their success can be explained by two factors. First, being member of a municipality themselves made it easier for them to discuss water quality issues with municipality staff rather than if they had been part of the waterboard staff. Secondly, being selected as they were, made them both highly motivated and supported by their own organisation.
In the Weser case, no specific jobs were introduced to bridge gaps between local projects and the WFD processes. Still, the influence of the executive management, process management and leadership should not be underestimated although scientific evidence may only be found after conducting a more in-depth scientific analysis focussing on the activities of all Area Cooperations in Lower Saxony.

Time and money matter

In the Weser river basin, Area Cooperations benefited from dedicated funds to steer the public participation and debates. For the Area Cooperations themselves, the annual budget for each Area A state granting of € 15,000 annually was uncertain for a long time. Once granted, it was mainly used for the production of flyers and other information material, or the outsourcing of studies on the effectiveness of potential measures and activities. It was not a guaranteed budget, but had to be applied for each year.
In France, and notably in the Rhone district, the creation of local water structure and hiring sub-basin "animateurs" was encouraged to tackle the issue of involving concerned people. Water agencies fund such wages on an average of 50% to 80%. Animateurs are full-time jobs. They are responsible for supporting water management and water planning in relation to all actors of the territory. They embody the integration across sectors and scales. Between technical considerations and political discourses they link expert knowledge and layman's concerns. They communicate water stakes and reformulate the expectations of people towards water.
In Brabant, the gross costs of the water ambassadors were funded by the Ministry of V&W from 2006 to 2009. In 2009 the Ministry of VROM funded half the costs and the other half was financed by the RBO. Municipalities themselves have to pay the overhead costs of this part-time function, whereas in France local authorities may benefit from financial support by the water agency.
In both cases, of Thau and Brabant, the effectiveness of the function (animateurs and water ambassadors) is largely dependent on the fact that the process of staff selection—for this function—brought up people who were most enthusiastic and had a positive attitude towards the issue.

Appropriation by self-organisation of specific actors

The Dutch case shows an important involvement of farmers, often not supportive but critical about the WFD. Farmer involvement was significant in France but not in Thau, where farmers did not voice many concerns. The Thau case shows local involvement of oyster producers. They defend environmental issues whereas in the Weser case nature protection is only represented explicitly by NGOs. Representatives of other governmental Nature Protection Departments are not included since their organisations are involved through their water department. The Weser case particularly underlines the issue of legitimacy of participants and the need of representatives to align and interact with their interest group. It also shows the potential in voluntary cooperations and agreements which complement the formal and rigid mechanism of administrative law in water protection zones involving farmers. This issue has still to be tackled in the Thau case.
In the Weser case, environmental NGOs organised themselves specifically to address the stakes of the WFD. They set up a multi-NGO platform called "Wassernetz". Despite internal debates about the legitimacy of the different representatives in this network, it allows the organisations within the network to define a shared position and defend it in many different areas. Municipalities, on the contrary, lacked explicit and efficient representation for the purpose of the WFD implementation. They were represented in Area Cooperations by one municipality but the coordination between municipalities was missing and the legitimacy of the municipality involved in the process was low.
In France, local authorities sometimes created joint-boards for water management at sub-basin level (5,000 km²) to deal with flood management, and water provision for multiple usages. They asked for national recognition and obtained in 2003[11] an official status of EPTB (public territorial body at river basin scale). Although EPTB did not organise themselves solely in the perspective of implementing the WFD, they have been welcomed by water agencies as necessary partners[12].

[11] Law on risks, July 30th, 2003

[12] The law on rural territories of February 23rd, 2005 acknowledged EPTB's role for wetland protection. EPTB's involvement in designing and implementing SAGE is acknowledged by LEMA (2006) and the first law implementing the Grenelle (2009-967 of August 3rd, 2009, Art. 29)

Contrary to water agencies, these EPTB are able to implement measures. The Thau basin is too small to be an EPTB. SMBT plays the role of implementing measures on a local basis.

Lessons Learnt for the second implementation cycle:

Local appropriation needs engagement of local authorities and other local actors that will be required to take measure. This engagement is necessary not only to ensure that they adapt and adopt the WFD according to their needs and interests, but also to ensure local implementation of requirements by higher level institutions. Lower water authorities and other local implementers for example, need to be considered as central. In the first implementation cycle, local participators often acted in defence of their autonomy and their resources. Again, more experience and understanding on the impact of the WFD e.g. on financial resources might facilitate the revision of the RBMPs and programme of measures in the second cycle. For this, concerns about the level of "ecological" ambition, financial issues and personnel resources (or lack of these) have to be considered and reacted on.

Local appropriation can be facilitated by funding "human interfaces". While commitment of mayors or stakeholders remains essential, dedicated facilitator positions can provide continuity and expand the scope of interactions much further and deeper than what can be done in meetings only.

Such jobs require a good understanding of water stakes and a professional legitimacy in relation to water experts. However, this is not only a technical position. Facilitating exchange, fostering stewardship and responsibility as well as dealing with personalities are important aspects of the job.

4.6 The role of expertise

The last theme concerning the implementation of the WFD that is discussed in this report is the role of expertise. Knowledge on the effects of measures is needed in particular. As it was already discussed in the inception report, the environmental objectives of the WFD are binding. If member states set objectives that cannot be reached; this may result in infringement procedures that ultimately bring along heavy fines.

There are a number of issues concerning expertise for the WFD. First of all, many doubt that the necessary ecological knowledge of the effects of measures exists (Lagacé, Holmes et al. 2008). Hence, decisions have to be made on an uncertain basis (cf. Brugnach, Dewulf et al. 2008). Secondly, the available expertise needs to be used in the decision-making process. This requires that the expertise is communicated to all stakeholders that play a role in the implementation process and that these stakeholders see this information as relevant and trust its reliability. Thirdly, collaboration between the experts and the other stakeholders may increase both the relevance of the expertise and the trust in it (e.g. Wynne 1996). Related to this point is the use of "local expertise": the expertise of farmers, environmental NGOs and other local stakeholders. They may lack official qualifications, such as an ecology degree or engineering, but may still have relevant information, experiences and insight. And finally, to help and address these issues just outlined, specific i-3s could be used. In the i-Five project one such i-3 has been studied: the Dutch WFD Explorer.

Lacking knowledge and uncertainties

While the challenges concerning expertise were approximately the same in the three case studies, the way in which they were addressed were not. In the Netherlands the development of the Explorer made it crystal clear that many so-called "knowledge rules" on measure-effect relations were either missing, or of insufficient quality. In the Thau basin, no specific model was developed

for the WFD; all the more because results from former models developed for securing oyster production (e.g.Omega Thau) and for water supply were available and known to by experts. Various results of these different models were integrated using “best professional judgement”. At national level, the lack of knowledge was addressed by updating all monitoring networks. In other parts of France, however, more systemic modelling took place. In Lower Saxony, the implementation process relied heavily on expertise available at the water management institutions. Uncertainty concerning the effects of measures was handled by formulating the environmental objectives in a more general way. In the Netherlands uncertainty about the effects of measures is handled by not setting lower standards for those water bodies that will most likely not reach a good water status by 2015 – 632 water bodies out of a total of 747—but, by using the possibility for extending deadlines first. For these water bodies no quantitative objectives at all have been set for 2015, merely a qualitative “expectation” (“verwachting”) has been set.

Use of expertise and user involvement

The use of the available expertise also differed a lot. Generally, it reflected the overall national approach to the implementation of the WFD, which in turn reflected the general approach to water governance. The Netherlands have a strong but separate water sector, which takes primary responsibility for the implementation of the WFD. Not surprisingly, especially expertise from the water sector was used in the implementation process. Since the late 1980s, this includes ecological expertise (Disco 2002; Mostert 2006). The choice of measures was based mainly on the judgment of experts from the water sector, partly supported by instruments and models and partly by experts from knowledgeable institutions. The waterboards developed the programme of measures and the objectives for regional waters. In large measure these proposals were accepted by both the higher level authorities, who incorporated these objectives and measures in their water management plans, but also by the stakeholders who were involved in the area processes.

One of the instruments used was the WFD Explorer.

Originally, this explorer was meant as a communication tool that would give a first impression of the possible effects of measures. WFD project leaders would be able to use this in interactive sessions with their political superiors and with other stakeholder groups. The waterboard experts, however, were more interested in a tool for more detailed analysis. In the end they did not trust the detailed outputs of the explorer—and rightly so, as it turned out that the scientific basis of the knowledge rules was meager. Moreover, it was only used by a few waterboards. Consequently, it did not result in a common, standardised knowledge base for setting objectives and choosing measures. The Ministry of V&W would have welcomed this as it would have increased the transparency of the implementation process. On the positive side, the explorer did integrate a lot of expertise from different water managers and a lot of external expertise. Further, the development process helped to identify major knowledge gaps and so significant efforts were made to fill in these gaps.

In Lower Saxony, building on a strong and institutionalised expertise, the integration of external expertise has become of more relevance to the water authorities because of the cut back in personnel. Both water authorities and stakeholders expect a high level knowledge base from the governmental representatives. Thus, there is a tendency among implementing agencies in Lower Saxony to give it a try themselves first before including outside expertise. Being aware of the WFD challenges, at the beginning of the implementation process, seventeen pilot projects on implementing the WFD have been conducted in Lower Saxony. This offered some possibilities for external parties to be involved. Yet, no discussion was started to learn from the experiences made in these pilot projects and to identify opportunities that go beyond mere compliance with the WFD. With regard to the consideration of stakeholder expertise in the Area Cooperations, the process was often considered not transparent, as the stakeholders did not receive feedback on how far

their input was considered.

In France, the overall objective for the implementation of the WFD was set in the Grenelle in 2007, which mainly incorporated expertise from the Seine basin. In the Rhône basin, the use of expertise for setting objectives and identifying a first set of possible measures was nevertheless substantial. The basin authority was attentive to defend Mediterranean specificities in terms of environmental and governance issues. The definition of the environmental objectives for the individual water bodies and the identification of measures were done largely by technical experts from the Water Agency, the regional and departmental State Agencies and some experts that were not sent by the public sector. They submitted their proposals at different levels (district and subdistrict) to the local authorities, associations and economic councils. In the Thau basin , a specific commission of the SAGE including certified experts and “lay experts” selected sets of measures in a very transparent way more locally. However, this collective process for selecting measures does not secure their effective implementation which depends on further procedures and funding.

In all three cases, the use of lay expertise has been very limited (see also section 4.4 on public participation). In the Netherlands, local stakeholders were involved in the selection of measures, but far less in setting the objectives.

Specific tools

Apart from the WFD-Explorer, the Dutch used various tools with a narrower scope, either ecological of hydrodynamic. In Germany, different systems were developed, such as a system for conducting a fish-based evaluation of the ecological status, which is freely available on the Internet. In practice, it proved to be difficult to define correct reference conditions as a basis for all classifications. In Hessen, another German state, an expert system FIS Mapro was developed for the planning, control and documentation of measures, which also predicts the effects of measures. This is, however, only available on the Intranet of the water authorities. In France, a system for evaluatiing water (SEEE) is being developed, which should be completed in 2010 according to plan.

Lessons learnt for the second cycle of WFD

Implementing the WFD is a complicated and in many ways highly technical matter. Lacking knowledge and integrating lay and expert knowledge are just some of the challenges related to expertise. The case studies show that local organizations that have a lot of expertise available in their own organisations, such as waterboards in the Netherlands, are at an advantage. They were able to develop a proposed programme of measures that was generally acceptable for both higher level authorities and local stakeholders involved in the planning process. In France and Germany this expertise is mostly available at higher administrative levels, weakening the position of the local organisations in the development of the programme of measures. Again, capacity building at a local level will strengthen the position of local authorities. Different approaches and tools for addressing these challenges exist, such as the WFD Explorer. These were not yet perfect but they can be and are being developed further. Still, they cannot and should not replace experts in water management organisations. Experts will be needed to critically judge the workings and the result of the instrument, or to integrate the knowledge brought in by external and lay experts.
The best—the only—way forward is to develop, try out and evaluate new approaches, react to the lessons learned, in other words, to be in continues learning process, in the spirit of adaptive management. At the moment a lot of attention is drawn to the lack of knowledge. More expertise will need to be developed to decrease uncertainties, but nevertheless some uncertainties will always remain, disregarding the amount of expertise developed. This should, however, not refrain us from taking action. Again, an adaptive approach is called for, accepting that our decisions are always based on preliminary and incomplete knowledge and emphasising learning and adjusting. (e.g. Pahl-Wostl 2008; Raadgever, Mostert et al. 2008).

5 General lessons learnt for the 2nd implementation cycle of the WFD

This chapter aggregates the general lessons learnt from the cross case comparison in the previous chapter for water managers and policy makers approaching the 2nd implementation cycle of the WFD.

In this project three case studies have been conducted on the implementation of WFD, the effectiveness of innovative instruments and institutions within the national context and their potential use in other contexts. While we presented our insights along the core challenges during the WFD implementation in the previous chapter, this chapter aggregates our results in order to provide to water managers and policy makers with a number of more general issues that emerged concerning the implementation of the Water Framework Directive.
Since we consider these as our main messages to the water policy level we have chosen a different format, hopefully facilitating their communication.

1. Institutional congruence
As the WFD did not specify how the required coordination at the river basin level should be organised, many different interpretations of what was required and appropriate emerged. In all three cases, the implementation of most measures resorts at the local level, but policy planning and funding of the measures might resort with entirely different authorities.
The French and the German case study show a distinct mismatch between the authorities that formulate objectives and draw up plans, and those that should implement or fund the measures. This institutional arrangement results in the need to negotiate the implementation of measures with parties that were not included in the planning process and may not feel in any way responsible for implementing the WFD. This makes the actual implementation of the measures uncertain. In the Dutch case, the institutions that have to implement and fund measures have been included in the planning process and are more committed to actually implement the measures. At national level, the key to the implementation of the WFD proved to be not so much the existence of basin-level organisations but rather an awareness of the necessity of a river basin approach, as well as a correspondence between institutions in charge of planning measures and the ones in charge of implementing them.
This leads us to our first lesson:
The institutions that decide on objectives and measures should include the ones that have to fund and/ or implement the measures in order to provide optimal conditions for the realisation of the programme of measures.

2. A cross-sectoral river basin approach

The status of water bodies may be affected by policy sectors and activities beyond the scope of water management. In these cases achieving a good water status requires integration between sectors so that water management planning is also taken into account by stakeholders outside of the water sector. The other way around is also important: optimisation within the water-sector alone may not take into account the significant benefits that measures can have beyond their effect on water. Furthermore, the WFD requires countries to take cost-effective measures. To do so, they need to compare measures that can be taken in different sectors and measures at different levels in the river basin. Such a truly integrated approach is highly challenging.
In all three cases, agriculture and spatial planning are acknowledged as key sectors to involve in the planning process to avoid discrepancies between water management and land use practices affecting water, but in practise they are not always involved.

This lack of integration at lower levels can be caused by constrains set by higher levels. In the Netherlands, for example, at the national level the Cabinet's ambition brief basically excluded measures related to farming and spatial planning. So, in the implementation process at the local level, water boards decided to improve the efficiency of waste water treatment plants, while agriculture is the source of two thirds of the nutrients in the regional waters and this is not dealt with.

The large majority of the measures for WFD will have to be taken by the water sector even though more cost-effective measures might be available in other sectors. Actors at the local level, such as Area Cooperations in Germany or waterboards in the Netherlands have no authority to induce the agricultural sector to take measures: this will have to be done at the national level. The French case in Thau is quite different (although not representative of France): economic interests and ecological objectives could well be integrated and spatial planning and water management were fairly well integrated in the area. This was facilitated by in the fact that oyster production is the flagship production in the area, while oysters also purify the water.

At the European level, integration of these policy fields is also insufficient. The Common Agricultural Policy structurally encourages intensive production, at the expense of water quality protection, despite the provisions of European directives such as WFD, the Nitrates directive and Natura 2000.

So we arrive at to our second lesson:

A trans-sectoral river basin approach needs support from European and national policy.

3. Active involvement of stakeholders

The WFD itself is of highly technical nature. It has high ambitions for improving the quality of European waters and it includes several new elements, such as binding ecological objectives, which did not exist before WFD in the three countries studied.

The case studies showed that the reporting skeleton, guiding the implementation, focused mainly on how to deal with the methodological and administrative requirements. This was not only the case for the authorities involved, but also permeated the many advisory boards or other participatory institutions that were established to allow active involvement of stakeholders.

Most water authorities though had little experience in setting up participatory processes. Discussions in the participatory processes were often overloaded with information and hard to understand, often obscuring the (water authorities') objectives for the participatory process and decreasing the motivation of the involved stakeholders. This limited the actual contribution of stakeholders.

Guidance documents were in all three cases often late, so water managers generally had to learn about these technical and methodological water issues or new procedures while at the same time the stakeholders had to be kept informed about the implementation of these guidance documents.

In this sense, the potential of participatory processes to initiate a learning process on the benefits and means of sustainable water resources management in all its complexity was not realised. Our third lesson is therefore:

Active involvement of stakeholders is severely hindered by the focus on methodological complexities and the administrative demands of the WFD, instead of the basic principle of improving the water quality in river basins.

4 Balancing top-down and bottom up

The WFD was implemented in a combination of top-down and bottom-up process. It is the first directive that was accompanied by a Common Implementation Strategy, developed jointly by the Member States and the European Commission. The aim of the CIS is to develop a common understanding of the WFD and provide guidance to the Member States on implementing the WFD.

These guidance documents can be viewed as standardized procedures, supporting the top down approach. Standardization makes the process of policy implementation easier to manage and possibly more transparent. It facilitates coordination and comparison between regions or river basins and can in that way support decision making at the river basin level.
A strong bottom-up element can, however, support integration of local knowledge, can do more justice to regional differences and can increase the willingness to adopt or support measures. Bottom-up processes benefit from a measure of local autonomy, allowing specific solutions to emerge in perhaps unforeseen ways.
The three case studies show that the top-down process of giving guidance and the bottom-up process of adapting existing water management for WFD, haven't completely converged. This is strongly due to the fact that guidances became available too late or were too general.
However, methods and procedures need to be general enough to deal with the diversity of the local level and allow local adaptation to avoid frustration of local processes. This leads to our fourth lesson:
Balancing top-down and bottom-up processes is necessary to ensure a basic level of standardisation and comparability of approaches, while at the same time acknowledging local conditions and local knowledge.

5. Attainability of objectives
In all cases, limited knowledge and data was available to fully answer questions raised by the WFD about the relative efficacy of measures and the achievement of good ecological status. This is also true for the Netherlands, despite an intensive multi-experts process to develop a common knowledge base in the WFD Explorer, a decision support tool that was developed to support the WFD decision making process. The Dutch case study demonstrated the difficulties of integrating data and expertise from different sectors, not only because of the complexity of the phenomena, but also for strategic reasons, as demonstrated by the development of three different tools for the three different policy fields: water management, agriculture, and spatial planning and the environment, represented by three ministries and the research institutes affiliated with them.
The cost-effectiveness was another issue that was hard to tackle. Beside the fact that the effects in itself are hard to quantify, the costs depend not only on the type of measures, but also on the scale of implementation and the location. Costs for measures in densely populated areas may be significantly higher than the same measures in sparsely populated areas. Additional costs, such as loss of productivity, further complicate these comparisons of cost-effectiveness. In France and Germany, furthermore, it is still not clear who shall bear the costs of measures. Concerning both sources of uncertainties (ecological and financial), expertise remains limited and therefore justification of optimal integrated measures is yet indicative only.
No country can guarantee that the objectives they have set will be met for all water bodies with their programme of measures, even if they manage to implement them all. It is simply impossible at this moment to quantitatively predict the effect of measures on ecology, because of a lack of data and expertise and the inherent uncertainty of complex systems. Additionally, the effects will often not be immediately measurable due to the time-lag between measure and effect. Cost-effectiveness is hard to establish. These complications were encountered in all three case studies and should be taken into account when reviewing the implementation of the WFD.
Furthermore, the non-achievement of objectives in 2015 does not necessarily result from a lack of effort by the Member States, but may also result from high ambitions. Achievement or non-achievement of objectives therefore, while obviously important, cannot be the only indicator of success of WFD implementation. The status of the European waters will benefit most if the European Commission focuses its enforcement efforts on member states that show little activity, even if they do achieve their objectives, and not on those Member States that make a serious effort, even if they do not achieve their objectives. This brings us to our fifth lesson:

Non attainment of environmental objectives, in itself, does not necessarily imply bad implementation of WFD.

6 Dealing with uncertainty

The uncertainty discussed above is to some amount insurmountable. Uncertainty on ecology, effectiveness of measures, time lags etc. can be reduced by more research, but it is unlikely to disappear completely. Yet, this should not be a reason for taking no action or being less ambitious. The complexity of the WFD implementation process/processes and of the ecological interactions in the river basins requires a water resource management approach that emphasises resilience and learning (e.g. from monitoring and experience). Water management needs to be flexible and institutions should be ready to learn from what happens and change course on the basis of observations in the system.

Adaptive water management acknowledges these requirements by increasing and sustaining the capacity to learn *while* managing. It supports an iterative process of testing and improving methods, of analysis as well as of management policies and practices. The integration of different processes and institutions now depend to a large extent on individual engagement of “animateurs”, coordinators, project leaders and other individuals. The learning process they facilitate need to be translated into the organizational processes in the institutions involved, in order to further improve integration and also to reduce vulnerability to personal changes. More specifically, in France, some stakeholders expressed difficulties regarding the programme of measures. All measures require (1) approval from different stakeholders and political officials, (2) fund raising and (3) procedures to issue due permits. The sooner the programme of measures is set, the sooner such procedures can begin. However, this impairs adaptation. Water issues are likely to change very quickly due to climatic events, new measurements and new scientific data. Adaptation to such changes under the WFD is limited to mid-term assessment (3 years after planning). More leeway for quick responses to unexpected events is required.

These challenges notwithstanding, we arrive at our sixth and final lesson on implementing the WFD:
Adaptive water management is the way forward for implementing the WFD.

6 Facilitating the adaptation of i-3s: The QuickScan training package

This chapter introduces the QuickScan as a factsheet and a method of facilitating learning about innovative institutions and instruments. Using the studied i-3s, examples are given on how to apply both.

The WFD implementation has raised so many questions and urged the development a lot of new processes that the idea to first have a look at already existenting instruments and institutions is obvious. However, there is a lack of structures, tools or methods that allow a transparent comparison of i-3s and their potential imbedding into other contexts. The issue of transferability of innovations has been addressed already in the case study sections. To actually support the (thought) experiment of transferring one i-3 to another basin, the QuickScan method was developed. This is presented in this section.

The method will be applied in three national training workshops and one international setting. How successful it was will be evaluated in the workshops' report.

QuickScans' general idea is to facilitate learning about innovative instruments and institutions (i-3s) which were developed in other basins or regions. It is developed as a generic factsheet in which challenges and conditions of implementing i-3s are defined and can thus be compared with the contexts in other basins. The purpose of the QuickScan is to support the informed decision-making if and how a specific i-3 can be adapted to the conditions in its' region or (sub) river basin.

Decision makers should benefit from the QuickScan by:

- discovering whether the i-3 could address the challenges that they face by implementing the WFD, considering the local conditions
- identifying possibilities for modifying and adapting an i-3
- being inspired for developing their own i-3.

For this, the factsheet first gives an overview on how the different challenges are addressed to support an effective implementation of the WFD. The second part describes the context, in which the i-3 was studied and then the central conditions which need to be met for a successful implementation of the i-3. These characteristics and requirements have to be identified e.g. through the institutional analysis.

The QuickScan factsheet is included as an example in this report for i-3s analysed in the i-Five case studies (see Annex 1), because the requirements for implementing an i-3 must be defined for each i-3. Still, the quick scan in its general form can be applied for other i-3s as well. It requires an in-depth understanding and analysis of the situation. Thus, other case studies or secondary literature could be used to evaluate the i-3 if the information is sufficient to fill the criteria of the quick scan.

As part of the QuickScan a general template for the factsheet has been developed which can be filled in on a specific i-3 by researchers or other experts. Here, each challenge is condensed so that the main insights of Chapter 3 are captured. This also includes key questions which identify the needs and requirements with regard to the challenges and which help to start the QuickScan application. Then, in a similar way, the characteristics and conditions of the river basin district are aggregated to allow the description of the context of the i-3. The background to this template is introduced in the next sub-section. In which way the template was used for the i-Five i-3s can be found in Annex 1. The factsheet can be used as a "desktop-tool", helping to reflect on an i-3. At the same time, the template has been developed in a table format, allowing the use in training session

with other QuickScan users. This training set-up is introduced in the final subchapter of this section.

6.1 The factsheet QuickScan

QuickScan should be considered a starting point but not a full-value evaluation. For designing and implementing an instrument or institution the QuickScan user might be interested or advised to consult further references.
This section presents the background on how the challenges and then context of an innovation are understood /defined. It can be used as guidance by researchers who want to present an innovative instrument or institution to other QuickScan users.

Challenges addressed by innovation (including rating (0/+/++)
The rating includes three levels: 0 (no support), + (little support), ++ (good support). Where necessary, it is possible to distinguish between the task or purpose of an innovation and how it functioned in practice.

- **Effective coordination across scales** is needed to apply a coherent basin approach and to develop and implement locally/regionally adapted measures, including their funding. *Does the innovation support "moving between scales", i.e. facilitates the decision making processes between the different levels?*
- **Effective integration between sectors** is needed to address pressures on water bodies from other sectors involving e.g. land use (e.g. spatial planning, agriculture, etc.). *Does the innovation facilitate cross-sector governance/instruments?*
- **Actively involving (organised) stakeholders** is needed to motivate stakeholders to engage in IWRM. *Does the innovation improve the transparency of—and trust in—the process among the stakeholders?*
- **"Appropriation" of the WFD at local level** is required when competent authorities are not responsible for implementing measures locally**.** Appropriation means, that local actors and authorities adopt the WFD objectives as part of their own objectives and will dedicate time and money to implement them, i.e. to translate environmental objectives from river basin to local level into appropriate measures. *Does the innovation change local actors and authorities' way of dealing with water. The innovation needs to support ownership and identification by the local level stakeholders and water managers with the (local) implementation of the WFD?*
- **Integration of expertise** is needed to ensure better assessment of the ecological, chemical and hydro-morphological state of water bodies and the potential measures. This should include cost-effectiveness, through the means of, e.g. different IC-tools, different actors and different forms of communication and collaboration. *Does the innovation fill identified knowledge gaps in an understandable and comprehensible way for both stakeholders and water authority experts?*

Characteristics and requirements of the innovation
For assessing its' adaptability to a new context, the characteristics of the innovation, as well as the

requirements for it as studied in its original contexts, need to be described. A list of guiding questions was developed (see below) which should be considered openly and adaptable. For specific innovations, questions can be added and those that are not relevant can be deleted. Applying the QuickScan as a factsheet or in training session, characteristics and requirements are treated separately.

- **Tasks or purposes of i-3:** Why was the innovation established? What was the original task?
- **Functioning**: How did the innovation function in practice?
- **Set-up**: What is the legal status of the innovation? What is the requirement for a good function of the i-3?
- **Physical conditions and type of water management problem addressed**: Were specific pressures prevalent in the studied situation (e.g. agricultural quality issues)? Does the innovation especially address specific problems or physical conditions? For which issues can the innovation be used and for which not?
- **Technical Expertise in water issues:** What was the role of technical expertise? Was it (further) developed by the innovation or communicated and integrated in the planning process with the help of the innovation? What kind of technical expertise is required for using the innovation?
- **Administrative structure:** What was the general administrative structure (e.g. strong decentralised or centralised approach) in which the innovation was applied? Are there specific requirements concerning the administrative structures, e.g. can it only work in a very centralised system or a very decentralised system?
- **Size:** What was the size of the area in which the innovation was applied? Is there a minimum/maximum size of the area that the innovation refers to? If so,why?
- **Scale:** Did the innovation connect (different) scales, and how?
- **Sectors:** Did the innovation connect other sectors beyond the water sectors, and how?
- **Informal structure:** What informal interactions took place between stakeholder groups around the innovation? Did this support, or hamper, the use? Does the innovation require trust and a good long-term relationship towards work? Could the innovation also work in one-off meetings, or if relationships have turned sour?
- **Social skills:** Were any special social skills applied? For instance, was a professional facilitator hired and if not, did this create problems? Are there any special skills necessary for implementing the innovation?
- **Resources:** How much personnel and financial resources did the water authorities, and if applicable other involved stakeholders, devote to the innovation? Was there a lack of resources? How much personnel and financial resources are needed minimally from water authorities, and if applicable other stakeholders, to apply the innovation effectively?
- **Largest barrier for successful implementation:** What was/is the biggest risk during the implementation of the innovation? How was it addressed?

6.2 Training for QuickScan: Modules for the national i-Five Workshops

The target group for applying and also validating the QuickScan reaches from practitioners to policy makers and also scientists. To bring QuickScan to this group, i-Five set up a series of national one-day-workshops,, inviting 15-30 representatives from different water authorities and interest groups implementing or designing the WFD implementation process.
In each of the national workshops i-Five presents its outcomes to the stakeholders in the country. The focus will be set on close cooperation with the case study stakeholders. However, central to all will be the introduction of QuickScan as a factsheet and a procedure for assessing innovative instruments and institutions (i-3).
For this, a template and examples using the i-Five i-3's can be found in Annex 1.
Fehler! Verweisquelle konnte nicht gefunden werden. describes the modules developed for this raining, also highlighting the participatory approach in i-Five, involving stakeholders from the basins in the research process.
Considering the focus of each case study, the CS leaders should decide whether they invite more regionally linked representatives or more of those who work at higher level or in different regions but in similar contexts.

Table 2: Modules for national stakeholder workshop (CS = case study)

Modules	Comments/Explanations
Modul 1: Case Study - Welcome from Case Study Stakeholder (5-10 min) - Welcome from Researcher and short intro to i-Five (10-15 min) - Presentation of CS results with a focus on i3 (30 min) - Optional: presentation of CS comparison with focus on i-Five-theme(s) - Discussion: What challenges of the WFD implementation are similar to the ones you learned from the CS?	- CS issues should be chosen in cooperation with stakeholders - Adapt the guiding question before, if necessary! - Main Issues of Discussion should be visualised on the flipchart
Modul 2: QuickScan - Intro of QuickScan factsheet—using the example of your i-3. - Exercise: Compare other i-3 of i-Five to transferability into your basin (1-2 h) **Step 1:** - Check challenges supported by i-3 and reflect what kind of support needed in your basin? **Step 2:** - Compare characteristics of i-3 context to your basins—where are differences, what needs to be adapted? - Foster discussion for developing a new I3. Collect results on flipchart for evaluation report	- decide, with your stakeholder which i3 you would like to compare. - do this yourself in the office. - you can let the audience do the exercise in small groups (4-5) and later collect the results in the plenary. This would allow the audience to perhaps consider different basins and not only one.
Modul 3: Final discussion. Evaluation of QuickScan as approach to facilitate transferability (30-45 min) Closure/Farewell (maybe again by stakeholder)	Evaluation: this can be organised e.g. as card exercise, guiding questions could be: - When you get back to the office, what will you tell your colleagues you have learned? What would you advise them to do? Which new insights and information could you use in your own work? - What did you miss? - Have you found a new i-3 to support your work?—Would you use the QuickScan for finding out about transferability of an i-3?

7 Outlook

The WFD is one of the most important environmental directives of the EU. It holds the promise of cleaner European waters and better aquatic ecology. Yet, as the three i-Five case studies have shown, implementing the WFD is a challenge. It requires an integrated approach involving all government levels and sectors, as well as the public, using all available knowledge on ecology—and perhaps even more. In response to these huge challenges, member states may focus their efforts on meeting the formal requirements of the WFD and setting the objectives as low as possible. If this happens the WFD will result in limited or no real improvements and will be reduced to an administrative burden only.

Member states and organisations and individuals within member states can also approach the WFD as an opportunity. Ten years after the entry into force of the WFD, a lot of experience has been gained with implementing the WFD. Different innovative instruments and institutions (i-3s) have been designed or have developed in practice in order to meet the different implementation challenges, including the “animateurs” in France, the Area Cooperations in Germany (Niedersachsen) and the WFD Explorer in the Netherlands. While they may not all have worked perfectly, in each case they worked well enough, or were promising enough, to deserve continuation and further development. Other countries and basins may be inspired by these i-3s. They may adapt them to the local needs and possibilities, or take over some ideas or elements for developing their own i-3s.

Learning from other experiences has been in the focus of this project. Different learning processes took place: between the researchers as well as between researchers and stakeholders—helping us to make the research more relevant to practical management. The most central motivation of i-Five from its very beginning, however, has been learning to support the transferability of instruments and institutions into other basins. For this, and to draw more attention towards the potential of innovative instruments and institutions, we developed the QuickScan method as a pragmatic approach to learn and to help learning. Transplanting innovations requires serious considerations of the institutional context. The individual basin context proofed being both too central and complex for successfully applying a simple template. In this sense, QuickScan aims help to communicate better and reflect on the essential ideas and conditions for implementing a specific innovation. It provides a thought experiment and thus helps to stimulate the learning processes which will be necessary for actually achieving the good ecological status or potential in European water bodies. In our national and international QuickScan trainings we will evaluate how beneficial the thought-experiments are and if QuickScan actually reaches its aims.

After all, this is only a first step: the implementation of the WFD continues. It is now time to implement measures in order to reach the objectives by 2015. In 2012, or even earlier, it will be necessary to begin with the preparation of the second river basin management plans. It is vital to continue and engage in a learning process which goes beyond reading documents. We hope that the six i-Five lessons for the second planning cycle resonate and that they help to approach the WFD as more than a formal and administrative burden, but as a chance for sustainable water management.

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ANNEX

Annex 1.0: The QuickScan Template

QuickScan is a method in order to quickly scan the context and character of an innovative instrument or institution for assessing its potential transferability and adaptability to a new target region (context). It was developed as part of the i-Five project (www.i-five.org) to support the exchange on experience and innovation among water managers and other stakeholders.
This template presents the background on how the challenges and characteristics of an innovation can be understood/defined.
Before the question of transferability/adaptability of the innovation can be discussed, an expert who studied it in its original context needs to go through the tables and answer the questions accordingly.
QuickScan should be considered a starting point not a throughout evaluation. In order to design and implement an instrument or institution the QuickScan user might be advised to consult further references.
Any water manager, researcher or other stakeholder who roughly wants to assess the potential for making use of another innovation. can be user of the QuickScan
The QuickScan is presented in two tables.
The first table presents the challenges which an innovation can address. These challenges have derived from the i-Five topics (see i-Five inception report or the i-Fives' final report at www.i-five.org).
If the QuickScan user has identified an innovation to address a challenge, the second table of the template table can be consulted. The key characteristics of the innovation and the requirements that have to be fulfilled for its successful implementation can be found here. If not all requirements are fulfilled, the reader is stimulated to adapt the innovation to its' own needs and possibilities, or to take over some aspects of the innovation and create a new one according to his own situation.
After reflecting on the tables, the final question should be considered for final assessment of transferability and adaptability of the innovation:
How do you judge the feasibility and the benefits of introducing this innovation in your situation?

This template provides the guiding questions in order tor use it for a specific innovation (see examples in the following annexes).

Challenges addressed by innovation (including rating (0/+/++)

The rating includes three levels: ***0 (no support), + (little support), ++ (good support).*** *Where necessary, it is possible to distinguish between the task or purpose of an innovation and how it functioned in practice.*

Central challenges as defined by i-Five	**Central challenges addressed by specific innovation**	**Support needed in new target region/basin:** *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
Effective coordination across scales is needed to apply a coherent basin approach and to develop and implement locally/regionally adapted measures, including their funding. *The i-3 supports "moving between scales", i.e. facilitates the decision making processes between the different levels.*	*Are there formal or informal linkages to different scales? Are decision-making processes influences at different scales? Is an information flow between scales supported? Rating?*	*Is the river basin approach accepted and implemented at all levels? Are regional/local interests sufficiently acknowledged?*
Effective integration between sectors is needed to address pressures on water bodies from other sectors involving e.g. land use (e.g. spatial planning, agriculture, etc.). *The innovation facilitates cross-sectoral governance/instruments.*	*What sectors are involved/ considered by the innovation? Is exchange supported? Rating?*	*Are all sectors linked to specific pressures involved in the RBMP development & implementation?*
Actively involving (organised) stakeholders is needed to motivate stakeholders to engage in IWRM. *The innovation improves the transparency of, and trust in, the process among the stakeholders.*	*Are (organised) stakeholders involved? Do stakeholders report trust and transparency?Rating?*	*Is there a lack of support of (major) stakeholder groups in water resources management?*

Central challenges as defined by i-Five	Central challenges addressed by specific innovation	Support needed in new target region/basin: *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
"Appropriation" of the WFD at the local level is required when competent authorities are not responsible for implementing measures locally. Appropriation means that local actors and authorities adopt the WFD objectives as part of their own objectives and will dedicate time and money to implement them, i.e. to translate environmental objectives from river basin to local level into appropriate measures. The innovation changes local actors and authorities' way of dealing with water. The innovation needs to support ownership and identification by the local level stakeholders and water managers with the (local) implementation of the WFD.	*Does the innovation support local involvement and cooperation with higher levels?*	*Are the same authorities in charge of planning and implementing measures?*
Integration of expertise is needed to assess the ecological, chemical and hydro-morphological state of water bodies and the potential measures better, this includes the cost-effectiveness, through the means of, for example, different IC-tools, different actors and different forms of communication and collaboration. *The innovation fills identified knowledge gaps in an understandable and comprehensible way for both stakeholders and water authority experts.*	*Is knowledge an issue? Are knowledge gaps identified and approached?*	*How are knowledge gaps defined*

Characteristics and requirements in the region/basin

The idea is to work through each column, reflecting on the questions and answering them.
For specific innovations, the list of categories should be considered open and adaptable. That means: more can be included, others can be left out, if not characteristic for the innovation.

Category	In the originally studied context	What is different to the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Tasks or purposes of innovation:	Why was the innovation established? What was the original task?				
Set-up:	What is the legal status of the innovation?		Is a specific embeddement in the institutional constext necessary? A specific legal status?		
Functioning	How did the innovation function in practice?				
Physical conditions and type of water management problem addressed:	Where there any typical or special problems in the studied context? What were the general water conditions (e.g. HMWB...)		For which issues can the innovation be used and for which not ?		
Technical Expertise in water issues:	What kind of expertise was available in the context of the innovation? Was there any lack of expertise?		What technical expertise is required for using the innovation?		
Administrative structure:	What was the general administrative structure (e.g. strong decentralised or centralised approach) in which the innovation was applied?		Are there specific requirements concerning the administrative structures, e.g. can it function better in a very centralised or a very decentralised system?		

Category	In the originally studied context	What is different to the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Size	What was the size of the area in which the innovation was applied?		Is there a minimum/maximum size of the area the innovation refers to? If so, why?		
Scale:	To which administrative/hydrological levels did the innovation connect to?		Is there a preferred administrative level at which the innovation should be placed?		
Sectors:	Did the innovation connect other sectors beyond the water sectors, and how?.				
Necessary resources:	How much personnel and financial resources did water authorities and, if applicable, other involved stakeholders devote to the innovation? Was there a lack of resources?		How much personnel and financial resources are minimally needed from water authorities and, if applicable, other stakeholders to apply the innovation effectively?		
Social skills:	Were any special social skills used? For instance, was a professional facilitator hired, and if not, did this create problems?		Are there any special skills necessary for implementing the innovation?		

Category	In the originally studied context	What is different to the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Informal structure:	Which informal interactions took place between (some) stakeholder groups around the innovation? Did this support or hamper the use?.		Does the innovation require trust and good long-term relationship towards work? Could the innovation also function in one-off meetings, or if relationships have turned sour?		
Largest barrier for successful implementation:	What was/ is the biggest risk during the implementation of the innovation? How was it addressed?				

Annex 1.1: QuickScan of the innovation “animateur de bassin versant”

QuickScan is a method in order to quickly scan the context and character of an innovative instrument or institution for assessing its potential transferability and adaptability to a new target region (context). It was developed as part of the i-Five project (www.i-five.org) to support the exchange on experiences and innovation among water managers and other stakeholders.

This form helps to start the reflection process on what actually are the challenges that need support and what are the conditions in comparison to the Animateur in the Thau Lagoon (France). For designing and implementing an instrument or institution the QuickScan user might be advised to consult the French case study report (available at www.i-five.org [Case 1—France: Bassin de Thau/ final case-study report.pdf])

Any water manager, researcher or other stakeholder who roughly wants to assess the potential for making use of another innovation. can be user of the QuickScan

The QuickScan is presented in two tables.

The first table presents the challenges which an innovation can address. These challenges have derived from the i-Five topics (see i-Five inception report or the i-Fives’ final report at www.i-five.org).

If the QuickScan user has identified an innovation to address a challenge, the second template table can be consulted., The key characteristics of the innovation and the conditions that have to be fulfilled for its successful implementation can be found here. If not all requirements are fulfilled, the reader is stimulated to adapt the innovation to its’ own needs and possibilities, or to take over some aspects of the innovation and create a new one for his own situation.

After reflecting on the tables, the final question should be considered for final assessment of transferability/adaptability of the innovation:

How do you judge the feasibility and the benefits of introducing this innovation in your situation?

Challenges addressed by “animateur de basin versant” (including rating (0/+/++)

The rating includes three levels: ***0 (no support), + (little support), ++ (good support).*** *Where necessary, it is possible to distinguish between the task or purpose of an innovation and how it functioned in practice.*

Central challenges as defined by i-Five	**Central challenges addressed by specific innovation**	**Support needed in new target region/basin:** *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*

Central challenges as defined by i-Five	Central challenges addressed by specific innovation	Support needed in new target region/basin: *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
Effective coordination across scales is needed to apply a coherent basin approach and to develop and implement locally/regionally adapted measures, including their funding. *The i-3 supports "moving between scales", i.e. facilitates the decision making processes between the different levels.*	**(++).** The animateur works for a local authority in charge of water but s/he also presents a node in the water network between local, regional and national actors (among them the water agency in charge of WFD implementation and state officers acting at different levels)—S/he makes links with neighbour sub-basins.	
Effective integration between sectors is needed to address pressures on water bodies from other sectors involving e.g. land use (e.g. spatial planning, agriculture, etc.). *The innovation facilitates cross-sectoral governance/instruments.*	**(++):** The animateur also acts as a node in the water network between water users (agriculture, fishing activities, shelfish farming, leisures, drinking water, waste water, inhabitants) and managers.	
Actively involving (organised) stakeholders is needed to motivate stakeholders to engage in IWRM. *The innovation improves the transparency of, and trust in, the process among the stakeholders.*	(++) The animateur involves other stakeholders first of all at bilateral level to prepare multi-lateral exchange. The animateur also organises participatory events.	

Central challenges as defined by i-Five	Central challenges addressed by specific innovation	Support needed in new target region/basin: *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
"Appropriation" of the WFD at the local level is required when competent authorities are not responsible for implementing measures locally. Appropriation means that local actors and authorities adopt the WFD objectives as part of their own objectives and will dedicate time and money to implement them, i.e. to translate environmental objectives from river basin to local level into appropriate measures. The innovation changes local actors and authorities' way of dealing with water.. The innovation needs to support ownership and identification by the local level stakeholders and water managers with the (local) implementation of the WFD.	**(++):** Animateurs work precisely on what locally resists integration and river basin management with a deep knowledge of the local situation and actors.	
Integration of expertise is needed to assess the ecological, chemical and hydro-morphological state of water bodies and the potential measures, including the cost-effectiveness, through the means of, for example, different IC-tools, different actors and different forms of communication and collaboration. *The innovation fills identified knowledge gaps in an understandable and comprehensible way for both stakeholders and water authority experts.*	**(++)**: With technical skills, the animateur makes the link between experts (from several sciences) and lay person and acts as a translator. S/he often holds the pencil for characterisation of the sub-basin and translation of expertise into planning documents	

Characteristics & Requirements for the "animateur des basin versant" in the region/basin

This table can be filled during the QuickScan exercise. The empty grey fields indicate that a specific category of requirements or characteristic is not central here.

Category	**In the originally studied context**	**What is different to new target region?**	**Requirements for implementing the innovation**	**Need conditions be adapted to suit the implementation of this innovation?**	***Can the innovation be adapted to suit the requirements?***
Tasks or purposes of innovation:	The general objective for the animateur of sub-basin is to support local water management. He/she is not necessarily dedicated to the WFD implementation but his/her role is critical to effectively implementing the WFD through water management plans or contracts.				
Functioning	There is no standard description for the job. This full time job has to be adjusted to the local situation. The ideal type of *animateur* is a young graduate in technical masters, male or female, highly motivated by human relationships, concerned by wise water management and careing for sub-basin participants.				

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Physical conditions and type of water management problem addressed:	Water quality issues (oyster production), Lagoon area			No specific requirements, but rather priorities have to be defined to deal with it. The animateur can manage a team in order to deal with several issues. The selection of the person for the position can be adjusted to local stakes.	
Technical Expertise in water issues:	Animateurs need local water policy supporters to rely on. They have to take care of the local water management history.			A level expertise in both administrative and technical water issues is required.	
Administrative structure:	In the French case, the animateur links the centralised river basin oriented structure, and the lowest level in charge and in power of deciding on the eventual implemented measures. Often the employer is an intermunicipal joint-board, but it can also be a private consultancy.			The animateur needs a sustainable employer.	
Size	Sub-basin : from 500 to 2500km².				
Scale:	Sub-basin level			Level of implementation of concrete measures	

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Sectors:	The animateur establishes and keeps contacts to the different sectors.				
Necessary resources:	This position has to be financed. This could be the hurdle for its' transposition.			Available financial resources of a (full-time) position	
Social skills:	The animateur is able to translate technical expertise produced by others into understandable and useful information for stakeholders and a larger public.			Good communication skills. In addition, skills in mediating and understanding are central for integrating the different sectors.	
Informal structure:	The water territory dedicated to the animateur can cross other water territories (for example with an aquifer)			It should be taken care of the cooperation between Animateurs.	
Largest barrier for successful implementation:	The animateur reflects a rather individualised approach for institutionalising integration. Uncertain support or gaps in financing the position might endanger the animateur's work, but many of them are thrilled by the challenge of constructing a new structure. The animateur incorporates a high amount of knowledge and social expertise which is closely linked to a person and can not easily been replaced.				

D) How do you judge the feasibility and the benefits of introducing this innovation in your situation?

ANNEX 1.2: QUICKSCAN OF THE INNOVATION AREA COOPERATION

QuickScan is a method in order to quickly scan the context and character of an innovative instrument or institution for assessing its' potential transferability and adaptability to a new target region (context). It was developed as part of the i-Five project (www.i-five.org) to support the exchange on experiences and innovation among water managers and other stakeholders.

This form helps to start the reflection process on what actually are the challenges that need support and what are the conditions in comparison to the Area Cooperation as set up in Lower Saxony (Weser basin, Germany). For designing and implementing the Area Cooperation, the QuickScan user might be advised to consult the German case study report (available at **www.i-five.org**):

D. Ridder, E. Interwies, I. Borowski, K. Gronemeier, C. Grambow: seeconsult, contributors (2010): Research Report No 2.2 INNOVATIVE INSTRUMENTS AND INSTITUTIONS IN IMPLEMENTING THE WATER FRAMEWORK DIRECTIVE: **THE GERMAN CASE STUDY**

The QuickScan user can be any water manager, researcher or other stakeholder who wants to roughly assess the potential for making use of another innovation.

The QuickScan is presented in two tables.

In the first table the challenges are presented which an innovation can address. These challenges have been derived from the i-Five themes (For more information see i-Five inception report and the i-Five final report at www.i-five.org).

If the QuickScan user has identified an innovation to address a challenge, the second table of the template can be consulted. Here, the key characteristics of the innovation and the requirements that have to be fulfilled for its successful implementation are found. If not all requirements are fulfilled, the reader is stimulated to adapt the innovation to its own needs and possibilities, or to take over some aspects of the innovation and create a new one according to his situation.

After reflecting on the tables, the final question should be considered for final assessment of transferability and adaptability of the innovation:

How do you judge the feasibility and the benefits of introducing this innovation in your situation?

Challenges addressed by Area Cooperations (including rating (0/+/++)

The rating includes three levels: ***0 (no support), + (little support), ++ (good support).*** *Where necessary, it is possible to distinguish between the task or purpose of an innovation and is't functioned in practice.*

Central challenges as defined by i-Five	**Central challenges addressed by specific innovation**	**Support needed in new target region/basin:** *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
Effective coordination across scales is needed to apply a coherent basin approach and to develop and implement locally/regionally adapted measures, including their funding. *The i-3 supports "moving between scales", i.e. facilitates the decision making processes between the different levels.*	(++) The Area Cooperation is located between local and regional scale and supports "moving between these scales", i.e. supporting exchange between actors of different decision making levels since it involves key actors from both levels.	*Is the river basin approach accepted and implemented at all levels? Are regional/local interests sufficiently acknowledged?*
Effective integration between sectors is needed to put pressure on water bodies from other sectors involving e.g. land use (e.g. spatial planning, agriculture, etc.). *The innovation facilitates cross-sectoral governance/instruments.*	(+)Representatives from different sectors are included in the Area Cooperation. For supporting integration, interactive discussions need to be emphasised during the Area Cooperation meetings. A feed back on these discussions need to given to the different sectors and. stakeholder-groups	*Are all sectors linked to specific pressures involved in the RBMP development & implementation?*
Actively involving (organised) stakeholders is needed to motivate stakeholders to engage in IWRM. *The innovation improves the transparency of, and trust in, the process among the stakeholders.*	(+): The Area Cooperation can provide information and transparency, if careful information management and feedback mechanisms are established. Thus it can increase trust in the management process.	*Is there a lack of support of (major) stakeholder groups in water resources management?*

Central challenges as defined by i-Five	Central challenges addressed by specific innovation	Support needed in new target region/basin: *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
"Appropriation" of the WFD at the local level is required when competent authorities are not responsible for implementing measures locally. Appropriation means that local actors and authorities adopt the WFD objectives as part of their own objectives and will dedicate time and money to implement them, i.e. to translate environmental objectives into appropriate measures, from river basin to local level .The innovation changes the way local on-site workers and authorities f deal with water. The innovation needs to support ownership and identification by the local level stakeholders and water managers with the (local) implementation of the WFD.	(+) The Area Cooperation can link regional to local processes. If transparency and trust (see above) is well achieved in the Area Cooperation, it can greatly contribute to local appropriation.	*Are the same authorities in charge of planning and implementing measures?*
Integration of expertise is needed to improve assessment both of the ecological, chemical and hydro-morphological state of water bodies and the potential measures, including the cost-effectiveness, by , ,using alternative IC-tools, different actors and other forms of communication and collaboration. *The innovation fills in identified knowledge gaps for both stakeholders and water authority experts in an understandable and comprehensible way. .*	(0): The Area Cooperation may help to identify knowledge gaps. However, it can only provide both stakeholders and water authority experts with the basis for using another tool in an understandable and comprehensible way.	*How are knowledge gaps defined?*

Requirements and characteristics for the Area Cooperations

This table can be filled during the QuickScan exercise. The grey fields indicate that a specific category of requirement/characteristic is not central here.

Category	In the originally studied context	What is different in the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Tasksor purposesof innovation:	The general objective for the Area Cooperations is the active involvement of interest groups into the implementation of the WFD to develop typical and innovative measures for the region. Tasks include support in monitoring, definition of management questions, inputs for the programme of measures and the river basin management plans.				
Set-up:	The Area Cooperations are not legal entities but have their own statutes and executive management, as defined in a regional by-law. Members are organisations and number of persons. Their number varies between 15 to 20.		The Area Cooperation needs to have formal acknowledgement. They need to include representatives of all relevant stakeholder groups.		
Functioning	Area cooperation entities meet regularly to inform members and to exchange information on the progress of the WFD implementation in the specific area. Members can only contribute to the agenda setting during the meetings.		Regular exchange is necessary for building and maintaining working relationships.		

Category	In the originally studied context	What is different in the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Physical conditions and type of water management problem addressed:	In the studied area, prevailing pressures were agricultural and hydro-morphological pressures.				
Technical Expertisein water issues:	Area Co-operations bring different expertise together. In Lower Saxony, the water authorities expertise was central and considered the main source of input for the other stakeholders.		Expertise on processing and content of water resources management, including central pressures need to be available.		
Administrative structure:	Lower Saxony is a territorial state, originally with a three-level administrative structure, now only on two levels. National transboundary issues are relevant due to the six other federal states involved in the Weser river basin district.				

Category	In the originally studied context	What is different in the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Size	The Area Cooperations refer to areas from 2,000 to 5,000 km². The size in general corresponds to the lowest working levels in the river basin district (working area).		The representatives need to be able to feed back to their stakeholder group. Thus, areas which are too diverse or too large hamper this (e.g. if too many (competing) municipalities are involved.		
Scale:	The Area Cooperation has bridged the local to regional level in a cross-sectoral manner. It cannot replace participatory structures on the ground for implementation of concrete measures.		Local/regional (see reason for size)		
Sectors:	Representatives from different sectors were involved.		Sectoral integration needs to be supported by higher level policy integration.		
Necessary resources:	personnel/time to engage in regular meetings, including their preparation, facilities/ meeting resources , r organising invitations, etc.				

Category	In the originally studied context	What is different in the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Social skills:	Successful Area Cooperation had chairs with good facilitation skills.		The chair or managing director of the Area Cooperation should be qualified in facilitation skills, including participant oriented management of information. A good knowledge and experience on the area covered or alternative training in systemic thinking, i.e. IWRM would be beneficial for responding to the different needs and interests.		
Informal structure:	Area Cooperations foster networking and exchange between stakeholders, especially from other regions. Exchange between different interest groups is limited in the beginning and needs to evolve. Existing networks and (semi-formal participatory process (e.g. in spatial planning) need to considered and if appropriate, integrated, not only for the sake of saving (stakeholders') resources.		Does the innovation require trust and good long-term relations to work? Could the innovation also work in one-off meetings, or if relations have turned sour?		

Category	In the originally studied context	What is different in the new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Largest barrier for successful implementation:	Transparency and trust is at risk if too much emphasis is put on high-level reporting (i.e. at river basin level) without providing lower level documents which reflect and acknowledge stakeholders' input. Careful management of expectations and clear communication from initiating water authorities is important. Unfortunately, this was not always responded to by the initiating authority. Instead, Area Cooperations are planned to be decreased s as regards meetings and its role in the implementation process.				

ANNEX 1.4: QUICKSCAN SHEET ON THE WFD EXPLORER: A SUITABLE INNOVATION FOR YOU?

QuickScan is a method of quickly scanning the context and character of an innovative instrument or institution in order to assess its potential transferability and adaptability to a new target region (context). It was developed as part of the i-Five project (www.i-five.org) to support the exchange on experiences and innovation among water managers and other stakeholders.

This form helps to start the reflection process on what are the challenges that actually need support, and what are the conditions in comparison to the considered innovation. For designing and implementing an instrument or institution the QuickScan user might like to consult the Dutch i-Five case study at www.i-five.org .

Challenges addressed by the WFD explore (including rating (0/+/++)

The rating includes three levels: ***0 (no support), + (little support), ++ (good support).*** *Where necessary, it is possible to distinguish between the task or purpose of an innovation and how it functioned in practice.*

Central challenges as defined by i-Five	**Central challenges addressed by specific innovation**	**Support needed in new target region/basin:** *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
Effective coordination across scales is needed to apply a coherent basin approach and to develop and implement locally/regionally adapted measures, including their funding. *The i-3 supports "moving between scales", i.e. facilitates the decision making processes between the different levels.*	**Effective coordination across scales** is needed to apply a coherent basin approach and to develop and implement locally/regionally adapted measures, including their funding. + *(present), ++ (potential)*	
Effective integration between sectors is needed to address pressures on water bodies from other sectors involving e.g. land use (e.g. spatial planning, agriculture, etc.). *The innovation facilitates cross-sectoral governing/instruments.*	**Effective integration between sectors** is needed to address pressures on water bodies from other sectors involving e.g. land use (e.g. spatial planning, agriculture, etc.). *0 (present), ++ (potential)*	
Actively involving (organised) stakeholders is needed to motivate stakeholders to engage in IWRM. *The innovation improves the transparency of, and trust in the process among the stakeholders.*	**Actively involving (organised) stakeholders is** needed to motivate other stakeholders to engage in IWRM. *. 0 (present), ++ (potential)*	

Central challenges as defined by i-Five	Central challenges addressed by specific innovation	Support needed in new target region/basin: *does the innovation address the challenges you face? (yes/no, keywords on how, why...)*
"Appropriation" of the WFD at the local level is required where competent authorities are not responsible for implementing measures locally. Appropriation means that local administrators and authorities adopt the WFD objectives as part of their own objectives and will dedicate time and money to implement them, i.e. transferring late environmental objectives from river basin to local level into appropriate measures. The innovation changes local administrators' and authorities' way of dealing with water. The innovation needs to support ownership and identification by the local level stakeholders and water managers with the (local) implementation of the WFD.	**"Appropriation" of the WFD at the local level** leads to the integration of local people and organisations into the implementation of the WFD, i.e. transferring environmental objectives from river basin to local level into appropriate measures. *0 (present)*	
Integration of expertise is needed to improve assessing the ecological, chemical and hydro-morphological state of water bodies and the potential measures, including the cost-effectiveness, for example by using , other IC-tools, alternative/different administrators and different forms of communication and collaboration. *The innovation fills identified knowledge gaps for both stakeholders and water authority experts in an understandable and comprehensible way. .*	I**ntegration of expertise:** The development of the Explorer brought together much of the available expertise on ecology, it helped to identify knowledge gaps and set the research agenda and stimulated discussion. It is now being developed as a tool for the experts.(+++)	

Characteristics and requirements for the WFD Explorer

This table can be filled during the QuickScan exercise. The empty grey fields indicate that a specific category of characteristic or requirement is not central here.

Category	**In the originally studied context**	**What is different to new target region?**	**Requirements for implementing the innovation**	**Need conditions be adapted to suit the implementation of this innovation?**	***Can the innovation be adapted to suit the requirements?***
Tasksor purposesof innovation:	Initially to make expertise available for the WFD planning process and for promoting informed discussion between different levels on the development of environmental objectives and the selection of measures.				
Functioning	The Explorer was planned as a computer based knowledge integration and simulation tool. The Explorer was especially used by the technical experts of the national water management agency and some regional water management organisations and not by those responsible for planning. The experts did not trust the tool enough to hand it over to the planners. They wanted more detailed and accurate information, for which the tool was not meant. In the end, the tool became too complex to support communication. .				

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Technical Expertise in water issues:	Quite some expertise was required. The tool had to be tailored to local conditions, e.g. the local water bodies had to be modelled. High level technical expertise was integrated. Furthermore experts in various fields had to provide input: water quality and quantity, chemical and ecological parameters. Finally expertise is needed to evaluate the results.			Technical expertise is needed to tailor the Explorer to local conditions, e.g. to model the local water system and to incorporate specific ecological knowledge rules valid for the region. Furthermore, expertise is required to use the instrument and to interpret the outcomes.	

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Administrative structure:				Encouragement from higher government levels can support the introduction of the Explorer. An organisation needs to develop a clear view, and support for, the objectives for which they want the instrument. They need to establish who exactly in the organisation will use the instrument and the ensuing results. The of the instrument set-up must correspond with the needs of these users. The supply of data must be ensured.	
Scale:	The (local) waterboards participated in the development of the (national) tool. Potentially, the use of one tool nationally makes it possible to aggregate local data at national level, but not all local water managers used the tool.				

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Sectors:	The tool was developed by and for the water management sector, with little interaction with the agricultural sector, for instance.				
Necessary resources:	The total costs of developing the Explorer can be estimated at around € 2.5 million.			A considerable investment, depending on available knowledge rules, data and hydro-dynamic rules, and the time involved for from those to adapting its use to local conditions. This needs to be supported by the management of their organisations although the results may be intangible for some time.	

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Social skills:				For tailoring the tool and keeping its development on track with the target audience, a participatory development process is necessary to initially identify priorities and communicate clearly development objectives not only with regard to technical water issues but also in terms of using the tool and the kind of support expected t.	

Category	In the originally studied context	What is different to new target region?	Requirements for implementing the innovation	Need conditions be adapted to suit the implementation of this innovation?	*Can the innovation be adapted to suit the requirements?*
Informal structure:				The actual use of the results of the Explorer requires trust—in the outcomes and ultimately in the experts who developed and used it. The Explorer may not work well in a very adversarial culture such as the USA.	
Largest barrier for successful implementation:	Lack of trust in the newly generated knowledge and difficulties to evaluate its quality, changing target audience, lack of ecological expertise.				

D) How do you judge the feasibility and the benefits of introducing this innovation in your situation?

ANNEX 2: HOW THE CURRENT REPORT IMPLEMENTS THE PROJECT PROPOSAL

The i-Five project was submitted for the first Joint Call for Research of IWRM-net on IWRM "Towards Effective River Basin Plans". In particular it addressed the topic "Water Governance" and the outputs "investigate the right territory for water management" and "interconnecting the different administrative scales"; "techniques for efficient setting of objectives"; "techniques to integrate expert judgement, multi-disciplinary scientific knowledge and stakeholders' involvement"; and "decision-support tools" (Call for research proposals; Pilot Common Call, p. 4).

Objectives and research questions

According to the proposal (p. 12-13), "the i-Five project aims at supporting the implementation of the WFD by promoting the transboundary exchange of experiences. This is implementd by broadening the range of methods and tools available to water managers and by helping them develop the best approach to fit specific needs. The scientific objectives of the project are:
To identify and evaluate i-3's for promoting cooperation between (a) different scales, (b) different sectors, (c) governmental and non-governmental stakeholders, and (d) technical experts and laymen.
To study different institutional settings, their dynamics, and how they affect the performance of different i-3s.
To study the potential for the transfer of specific instruments and institutions in different institutional settings.
(…)
To link and relate literature and approaches of different scientific disciplines, to implement an interdisciplinary approach and report about the experiences."

To meet these objectives, the common application form states that "the project will analyse ongoing WFD implementation processes in which particular i-3s are put into practice. The following research questions will be addressed:
Concerning objective I:
What are the characteristics of the i-3 being studied (basic concept, underlying assumptions, operational design parameters, implementation procedure, etc.)?
How is the implementation process of the WFD organised in general? Particular attention will be paid to:

- the interactions between different areas (basin, national, sub-basin, local, cf. Karstens et al., 2007) and sectors (agriculture, urban development, etc.)
- the involvement of stakeholders in the process (WFD art. 14)
- the involvement of technical experts and the role of their expertise
- the adaptive management capacity of the selected institutional settings.

How was the i-3 developed and applied? The same points will gain attention.
How did the i-3 function and what have been its effects to date?
Concerning objective II:
What are the characteristics of the national and local institutional settings (organisational structure, allocation of tasks and competencies, financing structures, decision-making procedures, 'adaptiveness'/ robustness and flexibility)?
Under which circumstances has the i-3 been applied (geographic, demographic, economic, socio-political, etc.)?
Which institutional characteristics and circumstances have been important for the functioning of the i-3s?
Concerning objective III:
In which institutional settings and under which circumstances can the i-3 work?

To what extent can the i-3 be adapted to different settings and circumstances?
Concerning objective IV:
Which new insights and experiences can we add to the literature on polycentric governance, public participation and collaboration, science and technology studies, participatory analysis, comparative public administration and the WFD?

The central themes specified in chapter 4 of this inception report will directly be followed by the first two objectives: "Institutional structure for implementing the WFD" addresses objective II and the other topics address objective I. The central themes will guide the case study research. In this case study research, the questions corresponding to objective I and II (research questions 1 to 7) will be rissen. The case comparison is geared towards answering research questions 8 and 9 and thereby reaching objective III. Objective IV and research question 10 constitute a continuous thread running through both the case studies and the case comparison. Our approach on this point has been described in section 4.1. of the inception report.

Expected results

According to the proposal (p. 18, WP3 description), "the tangible results of the i-Five project will comprise detailed information on i-3s for implementing the WFD with their requirements, and a 'Quick Scan' method that will help water management professionals to select, and modify where necessary, i-3's for their needs." The QuickScan will afford a systematic review firstly of the i-3 design parameters important for the implementation and secondly of the most important aspects of the water management system of the area in question. The more matching features and requirements are found on both sides, the higher the potential for transferability. The 'Quick-Scan' method will provide information that is valuable especially to policy-makers and practitioners who consider adaptation and adoption of i-3s under different circumstances. A 'Quick Scan' of an i-3 will, for example, inform practitioners whether the legal conditions for this i-3 have been met.

In this report we have compared the three case studies and the i-3s to then introduce the quick-scan method in section 6.

Dissemination and training

According to the proposal (p. 19) training and dissemination activities will comprise the following major activities:
Continuous dissemination—from the beginning onwards—of project information and achievements by means of the i Five project website and use of project newsletters, media and other means for 'low threshold' communication (…).
Dissemination of project results in scientific and policy-relevant (peer-reviewed) journals (…).
Reaching out to other countries in addition to the three partner countries by using European platforms for exchange in water management (e.g. EUWI newsletter, WISE newsletter) and using existing links—as well as establishing new ones—to European projects with larger scope and impacts (…). Presentations given during events organised by these projects, will gain European and other international attention.
Development of a training package based on the i-3s and the 'Quick Scan' method.
Cordinating „training workshops."

This report will feed into the series of national training workshops which present the major final activities in terms of dissemination. It will also be used for further publications.
Chapter 4 of this report has already been presented to water managers and researchers at the "Conference on Integrated River Basin Management under the Water Framework

Directive" in April 2010 (Lille).

At this point, the final case study reports have been published and scientific and policy-oriented publications are in preparation.

ANNEX 3: LIST OF FIGURES

ANNEX 4: LIST OF TABLES

ANNEX 5: GLOSSARY OF KEY TERMS, ACRONYMS AND ABBREVIATIONS

This glossary explains all acronyms and abbreviations used in the project, as well as a number of key terms. Key terms included are those that a) are not used in ordinary language, or b) may cause confusion because they are used in a "technical" sense that differs from ordinary usage or because different authors use them in different ways. In some cases the meaning of a term cannot be understood without knowing something of the theory in which it figures, and in those cases the essence of the theory in as far as relevant for the term has been summarized in a few sentences. These summaries do not do full justice to the theory and should be seen as a first introduction and an *aide-mémoire* only.

As a general rule, the i-Five project uses terms in their broadest sense. If a more narrow sense is meant, this is indicated by adding an adjective or an explanatory phrase or by using a different term with a more narrow meaning.

Readers are advised that the English terms used do not always correspond completely with related terms in other languages and that these terms may have somewhat different connotations.

The glossary will also be available on http://www.i-five.org, including hyperlinks to related terms and to articles from the WFD. Updates will be made available on line only.

Term		*Definition*
Active involvement	◄	Term from WFD art. 14. Active involvement refers to any level of *public participation* above *consultation*. Active involvement implies that the interested parties participate actively in the implementation of the WFD by discussing issues and contributing to their solution (Drafting Group, 2002; Ridder et al., 2005).
Agence de l'eau	◄	French organization at the district level in charge of (1) co-financing investments for an integrated water management(since the water act of 1964) and (2) planning water uses for a better protection of aquatic ecosystems(since the water act of 1992). The agence de l'eau collects taxes on polluting discharge and water uptakes and suppports water users' project for a better water management. Since 2006, Its five-year and annual program has been subjected to Senate and Legislature's approval. The Agence de l'eau is directed by a "comité de bassin" (basin committee) of water users, administrative officials and elected representatives, appointed by the Préfet.
Area cooperation	◄	Area cooperations are established as an advisory body for the implementation of the WFD in Lower Saxony, Germany (by decree in Dec. 2004). Members of the Area Cooperations are representatives of organizations like local authorities, water and agricultural associations, chambers of agriculture and industry, environmental NGOs, water utilities, authorities for water transport and forestry, etc.
Art. 5 analyses	◄	Three analyses that are required under WFD art. 5: (1) analysis of the characteristics of each river basin district, (2) review of the impact of human activity, and (3) economic analysis.
Artificial water body		a) "A body of surface water created by human activity" (WFD art. 2.8) b) A body of water created by human activity that is designated as an "artificial water body." Several additional requirements apply for designating a water body as "artificial" (WFD art. 4.3, see section 2.2.1 inception report
Broad public	◄	See *General public*
Certified expert	◄	See *Expert*

Collaboration	◄	From Latin “collaborare”, meaning literally working together. Collaboration can be analysed in terms of three phases. First, potential participants need to come together and commit themselves to collaborate ("convening"). Secondly, they need to agree on the goals for the collaboration and the measures to take ("direction setting"). Thirdly, this agreements needs to be implemented ("implementation"; Gray 1989). As used here, collaboration includes different forms of negotiation. Moreover, it is used as a descriptive and not as a prescriptive term. It takes a lot of time and effort and should only be embarked upon if the issue is important enough and there is a good chance of success (Huxham & Vangen, 2005).
Communication	◄	Social interaction through messages(Fiske, 1996). Communication is not limited to exchanging or disseminating information and may involve establishing or conforming social relations, identities and communities, giving orders, asking questions, influencing other people, self-expression, etc.
Competent authority	◄	National (or international: WFD art. 3.5) authority that Member States have to identify or newly establish as part of the “administrative arrangements” that they have to make for implementing the WFD on their territory (WFD art. 3.3 and WFD art. 3.5).
Consultation	◄	Level of *public participation*. It implies that the public can react to plans or ideas of government, either in writing or at a hearing, or that government actively seeks the comments and opinions of the public through for instance surveys and interviews. Art. 14 of the WFD refers to written consultation only, but WFD Preamble (14) and WFD Preamble (16) refer to consultation more generally (Drafting Group, 2002; Ridder et al., 2005).
Cooperation	◄	Used as synonym for *Collaboration*
Cost recovery	◄	See WFD art. 9. Member States have to “take account of the principle of recovery of the costs of water services, including environmental and resource costs”.
Decision Support System	◄	An interactive, computer-based systems, which helps decision makers use data and models to solve unstructured problems” (Gorry & Morton, 1971, quoted in Turban & Aronson, 2001, p. 13).
DSS	◄	*Decision Support System*
Environmental objectives	◄	The environmental objectives from WFD art. 4 (see section 2.2.1 and 2.2.3) of the inception report
Expert	◄	Person possessing *expertise*. This includes the “certified experts” with formal qualifications, usually within a specific scientific discipline, and “lay” or “local experts”, who lack formal qualifications but still possess special skills and information. In this report “experts” is used to refer to certified experts; the non-certified experts are always referred to as “lay” or “local experts”.
Expertise	◄	a) Special skills and information that are considered relevant for a specific issue (“expertise in…”). b) The products of expertise, such as research reports and advices.
FRD	◄	Flood risk directive (Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks)
General public	◄	Individual citizens. In WFD Preamble (46) the term is used loosely and seems to refer to the individual citizens and organized stakeholders.
Good chemical status	◄	See section 2.2.1 of the inception report.
Good ecological potential	◄	See section 2.2.1 of the inception report
Good ecological status	◄	See section 2.2.1 of the inception report
Good quantitative status	◄	See section 2.2.1 of the inception report
Good water status	◄	See section 2.2.1 of the inception report
Groundwater body	◄	"A distinct volume of groundwater within an aquifer or aquifers" (WFD art. 2.12)

Harmonization	◄	Operation securing consistency within a group
Heavily modified water body	◄	a) A surface water body that "as a result of physical alterations by human activity is substantially changed in character" (WFD art. 2.9) b) Such a body of water that has been designated as a "heavily modified water body". Several additional requirements apply for designating a water body as "heavily modified" (WFD art. 4.3, See section 2.2.1 of the inception report)
I-3	◄	Innovative instruments and institutions for implementing the WFD. I-3s may a) be designed purposely to help the implementation, b) emerge in the implementation process without being purposely designed, or c) be "transplanted" from elsewhere. The i-3s studies in the i-Five project fall in category a) and b), but their "transplantability" will be assessed.
IC-tool	◄	*Information and communication tool*
Implementation	◄	(European directives) Transposition in national law, followed by tthe application in practice.
Information and communication tool	◄	Material artefact, device or software to support communication and/or collaboration (Craps & Maurel, 2003; Ridder et al., 2005).
Infringement procedure	◄	Procedure that the European Commission can start if it thinks that a Member States has not implemented a directive correctly. Ultimately, the European Court of Justice may impose hefty fines and penalties. (art. 226-228 EC Treaty, see section 2.3.1)
Innovation (innovative)	◄	Practical application of new and original solutions. Innovation is therefore not the same as invention. Moreover, the innovative character of solutions is relative: what is new and original in one country or one basin, may be standard practice in another. The term innovation has positive connotations, and indeed learning is not possible without innovation. However, innovation implies specific goals to achieved and is therefore not neutral, and innovation is not necessarily effective for reaching these goals.
Institution	◄	All "humanly devised constraints that structure human interaction. They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behaviour, conventions and self-imposed codes of conduct), and their enforcement characteristics" (North, 1990). Other authors use the term to refer to formal institutions or to organizations only.
Instrument	◄	Artefact crafted by humans in order to achieve specific goals.
Integration	◄	1. To make into a whole by bringing all parts together; unify. This operation may require mutual adjustment so as to overcome contradic-tions between parts and to reach harmonization. 2a. To join with something else; unite. 2b. To make part of a larger unit: integrate the new procedures into the work routine (www.answers.com).
Interested party	◄	Term used in WFD, art. 14. Considered to be synonymous with *stakeholder*, first meaning.
Lay expert	◄	See *Expert*
Legal uncertainty	◄	*Uncertainty* resulting from vague or ambiguous legal provisions and from difficulties in predicting how the courts will interpret these provisions and rule in specific cases (and, in the context of European Law, whether or not the European Commission will start an infringement procedure).
Local expert	◄	See *Expert*
Measures (WFD)	◄	"Basic measures" that are required under existing directives (WFD art. 11.3) and "supplementary measures" that may be needed for achieving the environmental objectives of the Directive (WFD art. 11.3). Together, they make up the "programme of measures" (WFD art. 11.2). According to WFD Annex III(b), Member States have to select the most cost-effective combination of measures, based on the economic analysis of water uses, but the basic measures have to be included in the programme of measures in any case.
MSFD	◄	Marine strategy framework directive (2008/56/EC)

NGO	◄	Non-governmental organization
Political uncertainty	◄	*Uncertainty* concerning the future behaviour and decisions of political decision-makers, such as elected representatives and ministers, that may result from the difficulty of involving and gaining commitment from them early in the policy process and from political changes that may take place later on.
PP	◄	*Public participation*
Programme of measures	◄	See *Measures*
Public	◄	"One or more natural or legal persons and (…) their associations, organisations or groups" (Aarhus Convention, SEA Directive (2001/42/EC)). Cf. *Stakeholder*. Government bodies are usually not considered to be part of the "public".
Public involvement	◄	See *Public participation*
Public participation	◄	Direct participation in decision-making by non-governmental stakeholders (the general public, individual companies and organized interest groups). It requires but goes beyond providing access to and actively disseminating information, and may include consultation and different forms of active involvement of the public (Ridder et al., 2005). Other authors reserve the term for participation by the general public only and contrast it with "stakeholder participation": participation by organized stakeholders. Still other authors use "(public) participation" as one form of "public involvement", together with "consultation". In this case "(public) participation" refers to any level of public participation (in our sense) above consultation.
RBMP	◄	*River basin management plan*
Reference conditions	◄	The natural or near-natural conditions of a specific type of water body. They form the basis for determining the "good ecological status" (WFD Annex V, see section 2.2.2)
Reference site	◄	Site with natural or near-natural conditions used for determining the reference conditions for a specific type of water body.
River basin	◄	"The area of land from which all surface run-off flows (…) into the sea at a single river mouth, estuary or delta" (WFD art. 2.13). In practice, this term is often used to refer to the main management unit for implementing the WFD: the *river basin district*.
River basin district	◄	Main management unit for implementing the WFD, consisting of one or more adjacent *river basins*, including coastal waters and the groundwaters assigned to the district (WFD art. 2.13 and WFD art. 3.1).
River basin management plan	◄	Plans required by WFD art. 13, following the procedure of WFD art. 14.1.
SAGE	◄	Schéma d'Aménagement et de Gestion des Eaux. French instrument created by the French water act of 1992. This binding planning document determines objectives and rules required to reach a integrated water management at the scale of the sub-basin. Should be in accordance with the *SDAGE*. The SAGE is developed by a local commission of water (Commission locale de l'eau) which members are appointed by the Préfet among administrative officials, elected representatives and NGO.
SCoT	◄	*Schéma de Cohérence Territoriale*. French intermunicipal spatial planning policy.
SDAGE	◄	Schéma Directeur d'Aménagement et de Gestion des Eaux. French instrument created by the French water act of 1992. This binding planning document determines objectives and principles required to reach a integrated water management at the scale of the district. The SDAGE is co-developed by the Agence de l'eau and the state office in charge of the environment at the district level, under the responsibility of the Préfet coordonnateur de bassin. It is subjected to public inquiry and Préfet's approval.

Social learning	◄	A process of collective and communicative learning, leading to new knowledge, and skills, the development of trust and new or improved relations. This in turn forms the basis for a common understanding of the issue at hand and for collective action (cf. Muro, 2008). Social learning may be summarized in one phrase as “learning together to manage together” (Ridder et al., 2005).
Stakeholder	◄	Any person, group or organization with an interest or “stake” in an issue, either because they may be affected by the issue or because they may have some influence on its outcome (cf. Freeman, 1984). Stakeholder in this sense includes authorities, experts, the “general public” and organized interest groups. Other authors reserve the term for organized interest groups only.
Stakeholder participation	◄	See *Public participation*.
Surface water body	◄	"A discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water" (WFD art. 2.10, WFD Annex II; see section 2.2.3)
SWOT analysis	◄	Analaysis of "Strengts, Weaknesses, Opportunities and Threats" (Bradford, Duncan & Tarcy 2000)
Technical expert	◄	A *Certified expert* with formal qualifications in a technical or natural science discipline.
Technical-scientific uncertainty	◄	*Uncertainty* concerning technical and natural system, in the context of the WFD especially concerning the effects of measures on the water status.
TOR	◄	Terms of reference
Trust	◄	1. (noun) the firm belief that an actor will act (or a technical system will perform) dependably, securely and reliably within a specific context. 2. (verb) acting on the basis of this belief.
Uncertainty	◄	Uncertainty refers to the situation in which there is not a unique and complete understanding of an object or a system because of the inherent variability or unpredictability of the object or system, because of limited or imperfect information, or because the object or system and the available information on it can be seen and interpreted in different perspectives (Brugnach et al., 2008). In this report, we distinguish between technical-scientific uncertainty, legal uncertainty and political uncertainty.
Water body	◄	Smallest management unit for implementing the WFD. See *Surface water body* and *Groundwater Body* and section 2.2.3.
WFD	◄	European Water Framework Directive (2000/60/EC)
Wiki	◄	A page or collection of Web pages designed to enable anyone who accesses it to contribute or modify content, using a simplified markup language. (http://en.wikipedia.org/wiki/Wiki)