



Water Governance in Europe

Insights from Spain, the UK, Finland and Estonia

Report prepared for the All Party Committee on Environmental Objectives
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Lessons learned from the four case study countries

Policy processes targeting fresh, coast and marine management are not well integrated

River Basin Management Plans (RBMPs), Marine Strategies and Flood Risk Management Plans are all interconnected by their aims and content, and should therefore be well coordinated. These policy processes currently have different implementation cycles and target years as dictated by the EU acquis. Across the four case study countries (Estonia, Finland, Spain and UK) the integration of freshwater and marine policy processes has reached different levels. In the UK there has been limited integration of inland and marine policies. In the Basque Country, Spain, flood management has been integrated into the RBMPs and preventive measures have been included. In Estonia, flood management plans are being prepared together with the updating of the RBMPs and meetings for public consultations on the two Directives are planned. In Finland the integration of these processes goes further and stakeholders working on the Marine Strategy and the Flood Directive are invited to the relevant cooperation and working groups of the RBMP. This means that separate meetings are not required for the different policy processes. Currently each of the above-mentioned planning processes requires several public hearings. In coastal regions where there is risk of flooding consultations occur repetitively which can lead to consultation fatigue. Therefore, in Finland, the public consultation on the RBMPs, the Marine Strategy and Flood Risk Management Plans will be held at the same time in 2014.

Managing water from a spatial point of view is a challenge considering existing governance frameworks based on functional approaches.

Effective water governance is dependent not only on efficient integration of different policies, but also on efficient institutions. The organizational arrangements for water administration set out in the EU Water Framework Directive (WFD) state that the geographical boundaries of a river basin should define the administrative boundaries. In practice, this means setting up new institutions or redefining the role and functions of existing governance institutions. This study shows that the transition from established administrative boundaries to jurisdictions based on geographical boundaries has been a challenge in many countries. It should, however, be noted that there are positive examples such as in the Basque region in Spain where the regional government has wide jurisdiction defined by the boundaries of the Basin.

The development of River Basin Management Plans and selection of measures is undertaken differently in the four countries

This study shows that the four case study countries have different processes for preparing RBMPs, and that the RBMPs with their Programmes of Measures guide and influence state and non-state actors at different levels. In Finland and Estonia, the RBMPs are not legally binding, but serve instead to guide civil servants in their decision-making on environmental or water permits and planning following traditional spatial planning frameworks. In Spain the central government devises those RBMPs which cover several regions, while regional water agencies implement RBMPs developed for a basin located within a single autonomous administrative region. This has led to parallel systems of implementation of RBMPs.

Monitoring systems to gauge the effectiveness of the implementation of agreed measures are weak

Proper assessment and monitoring should be put in place up front to gauge their effectiveness of agreed measures. This is currently lacking in most cases with some exemptions. There is an effective monitoring programme in place in the Basque region of Spain, which aims to follow up agricultural water protection measures. A tool to assess the potential benefits of different Packages of Measures has been developed in Finland. The implementation of measures can be facilitated in various ways. For example, in Finland the Vesijärvi Foundation has taken the lead in drafting local action plans with estimates of the funding needed for each activity. It also funds these activities and follows up on implementation. Another example is the new catchment-based approach in England and Wales, which is in its pilot phase. If it is successful, it has the potential to build local ownership and thus facilitate the implementation of various measures to achieve sustainable water management.

The public and private sectors have different roles in water governance in the case study countries. Ranging from fully public to public-private partnerships

Public-private partnerships as service delivery mechanisms are growing in Europe. This study reveals a variety of different models, ranging from the privatization of infrastructure and delivery functions in the UK to partnerships built on contracting out specific functions. In the UK, England and Wales, the water supply and sewerage services have been privatized. The privatization was justified because of the general decline in the aging physical infrastructure at a time when quality targets were becoming increasingly important. The public sector maintains the regulatory function and controls and influences the provision of services and the pricing policy. Ofwat, a regulatory body, function as the “market maker” in the water and sewerage sector. The privatization process appears to have resulted in a more centralized water sector. The UK system has steered investment into infrastructure which may have discouraged alternative management options. In Spain, the responsibility to maintain the water supply and sanitation services are under the authority of the municipalities. Service provision can be private, public or be based on a consortium of municipalities. There is also a system of public, private and collective water rights in place, which requires concessions from the water authority for its use. Water trading is a new area being explored in Spain to achieve greater water efficiency. Water resources have monetary values attributed to them, and compensation is paid for voluntary transfers of water user rights.

Stakeholder participation in water management differs across the four case studies

Stakeholder participation is broadly defined as allowing stakeholders and the general public to influence plans and the outcomes of policy processes. Stakeholders’ attitudes, perceptions, beliefs and knowledge influence the outputs of water governance. In recent decades governance related to water has promoted processes encouraging the involvement of stakeholders compared to traditional top-down and centrally driven decision-making processes. The experiences of the UK, Spain, Finland and Estonia demonstrate different approaches to local implementation and participation. For example, in Estonia, the government decided to develop sub-river basin management plans. The plans were coordinated by the county environmental departments. Since a government restructure these departments have been replaced. Now RBMPs are coordinated by Env Board, and sub river plans are no longer being developed. This indicates that despite the emphasis on the role of scale and participation in the WFD, more needs to be done to encourage greater involvement of local actors. In the UK, there has been an acknowledgement of the lack of stakeholder participation in the

first phase of WFD implementation. In preparing for the second phase, the role of participation has been highlighted as a priority. The UK is planning to introduce a catchment-based approach based on cross-sector collaboration and effective stakeholder participation. In Estonia and Spain, new platforms involving public, private and civil society actors have already been established. The Water Management Commission in Estonia and the Environmental Advisory Council in Spain represent institutional innovations that enable participation across sectors and administrative levels.

Measures that support stakeholder participation in water management appears to be central

This study demonstrates the need for active participation at the local level to achieve lasting results. Local stakeholder engagement has been successful in some places, but the involvement of the general public remains a big challenge in all countries and needs more attention. Experience from Finland and Spain demonstrates that there are often local variations in the level of engagement by different stakeholders. A common insight across the countries was the need to build relationships and trust. Establishing new institutions is not sufficient for the effective engagement of local actors. Providing funds for participation, exchanges and learning is an important part of effective water governance. Identifying context-specific solutions and measures requires capacity building and the provision of opportunities for bottom-up approaches to local governance. However, the funding and human resources to support such innovation has largely been lacking. There is now an opportunity for the EU and its member states to target e.g. payment schemes to launch stakeholder negotiation platforms.

There is a need to support and recognize the work of local stakeholders in water resources management. The four case studies provide examples of how community management of water resources have both enabled as well as disabled effective management depending on the institutional set-up. Examples of both can be found in the UK. The two Marine Spatial Planning pilots proved largely successful due to the use of established groups and communication channels. On the freshwater management side a mismatch in scale between river basin districts and stakeholder groups proved to be a barrier for the effective implementation of the first phase of the WFD. Various examples of how different stakeholder groups collectively manage water resources were noted in the study. Collective management can bring efficient results if it is based on a group of individuals working effectively together. Authorities communicate with these collectives instead of individuals, and the collectives are in turn accountable to the authorities. For example, in Finland, inhabitants of sparsely populated areas not covered by municipal water supply and sanitation systems have formed cooperatives to organize water and sewerage services. They receive support from the municipalities. In addition, collectives manage fishing rights as cooperatives in Finland. In Spain, water user associations play a significant role in water governance. They may manage irrigation systems and the use of groundwater resources. Further they implement monitor and control the distribution of water rights and decide on their enforcement. Some of these associations are public-private partnerships but have the legal status of a public authority.

Engaged stakeholders raise awareness and promote sustainability

In the study examples of local groups actively working for water protection, such as the local water protection associations in Finland, are noted. These actors are interested in water issues and can be encouraged to implement water protection measures or monitoring their implementation if sufficient support is provided. They play an important role in environmental education for local people. For example, the Basque region of Spain has facilitated a process aimed at engaging different

stakeholders in monitoring the quality and quantity of water resources in the basin. The results show that new perspectives have been generated. Different management views have been reconciled and the region, as a result, has experienced a significant decline in the number of complaints about the RBMP.

1 Introduction

Water governance remains high on the political agenda. The UN-Water Report on Water Resources Management for Rio+20 states that progress has been made, but much remains to be done in terms of governance. Coordination across sectors and administrative levels is a challenge in many parts of the world (UNEP 2012).

Water resources have received increased attention across the European Union and 2012 was designated the European year of water. The European Commission has reiterated the need for improved coordination in the implementation of EU policies on water and the marine environment, nature and biodiversity. These form the backbone of environmental protection for Europe's ecosystems and their services. Nonetheless, the achievement of the EU's water policy goals is threatened by a number of existing and emerging challenges, such as pollution, climate change, land use change, energy production, industry, agriculture and tourism. These challenges as well as urban development and demographic change are all linked to the current unsustainable management of water resources. The Commission's *Blueprint to Safeguard Europe's Water Resources*, published in November 2012, highlights the need for improved integration between sectors to address competition between agriculture, the wider public and industry. It also provides incentives for an efficient water value chain (European Commission 2012).

To gain a better understanding of current trends, the Commission has conducted assessments of and reviews on water scarcity, drought, and climate change adaptation and vulnerability. The Commission's Blueprint reveals that only 53% of European waterways are likely to meet the targets set out in the EU's Water Framework Directive (WFD) within the specified timeframe. The long-term objective of the Blueprint is to provide the means to ensure the sustainability of all activities that have an impact on water, thereby securing the availability of good quality water for sustainable and equitable water use. It should also be mentioned that the Blueprint dovetails with the EU 2020 Strategy and the 2011 Resource Efficiency Roadmap.

The EU has created opportunities for improved policy coordination through the WFD, the Marine Strategy, Natura 2000, Nitrate Directive, Flood Directive and the Common Agricultural Policy (CAP). The White paper strategy lays the ground for integrated governance approaches. The level of diversity in Europe, however, presents multiple opportunities and challenges for implementing EU Directives. This review provides an overview with examples of how water governance has been developed in four countries: Spain, the United Kingdom, Finland and Estonia.

1.1 Water governance

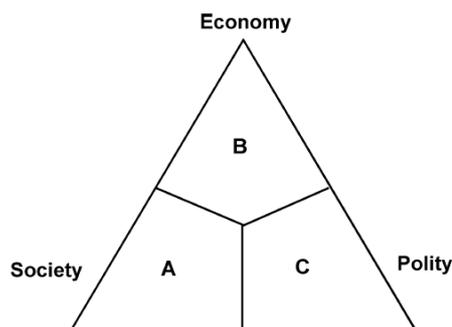
The governance approach covers the whole range of institutions and relationships involved in the process of governing (Pierre and Peters 2000). Managing water resources involves understanding complex systems with both human and natural components. To manage these systems successfully, institutions with divergent interests and expertise must work together. In Europe, pressures on freshwater systems and coastal areas have led to an increasing number of environmental

infringements¹ as well as conflicting interests in the management of freshwater and coastal resources.

The concept of water governance has gained momentum at the international level in recent years. According to the OECD (2011), “better water governance is now recognized worldwide as a key condition for a fairer, cleaner and greener economy”. The United Nations has initiated several processes in support of initiatives to improve water governance. UN-Water was established in 2003 to integrate and mainstream water into the UN’s programmes of work. UNDP, for example, initiated a programme on water governance in 1998, funded by Sida, as a result of which the Water Governance Facility was established, hosted by Swedish International Water Institute (SIWI), to provide policy advice to governments on water resource management.

Water resources must be approached not simply as a biophysical entity, but as a “mediating object” (Ison et al. 2012), that is, a sociotechnical entity which resource users and managers construct through their words and actions, invariably inserting their own interests and perspectives. This view recognizes that stakeholders are public sector, private sector and civil society actors, who actively construct and promote their own stakes in water resources and influence the stakes of others. The Boulding Triangle (see Figure 1) exemplifies this understanding that governance is not limited to public policy but, particularly in the case of water producers and users, shaped by the roles of private sector and civil society actors.

Figure 1: The Boulding Triangle



Source: Boulding 1970

2 Objective and Methodology

This study examines wider management practices linked to water governance of limnic, groundwater and marine systems in Europe. Based on a recognition of the need for more coordinated, holistic and inter-sectoral policy implementation, this study explores the lessons learned from developing and implementing new or better coordinated approaches to water governance. It provides an overview of current water governance arrangements in four countries, and examples of where these support effective and coherent implementation of the various EU directives linked to the water sector. The

¹ The Commission documented 304 infringements in 2012 compared with 421 in 2006. The water-related infringements represented 24% of all infringements under DG ENV. The stages of infringement include: **17 cases: Non-communication:** infringements are opened if a Member State fails to notify legislation which transposes a specific directive before a deadline given in a directive. **9 cases: Not classified.** **79 cases: Non-conformity cases** are opened if shortcomings are identified in the transposition of a given directive in a Member State. **199 Bad application cases** address shortcomings in the application of the transposed provisions of a directive by a Member State.

study asks a number of questions:

- Who are the key stakeholders?
- What is the division of responsibility between different sectors and scales?
- Are current administrative practices (management instruments) suitable for water governance?
- To what extent are transparency, public participation and accountability promoted in water resource management?
- What are the key measures used to promote participation?

The study departs from a soft system approach. The core of this method is to view the sector, in this case the water sector, as a whole. Changing one part of the system, or initiating one course of action, will create changes elsewhere in the system. In the case of water governance, given its broad definition, this presents a challenge. What particularly distinguishes the soft system approach is that it reveals and deals explicitly with the different world views of stakeholders. Soft systems methodology emphasizes world views that are sometimes in conflict, such as conservation and production.

We used a combination of literature review and multi-stakeholder consultations to get a picture of water governance in the context of the four case study countries. The consultation process was conducted using semi-structured interviews. It was a qualitative assessment to identify the water management issues faced by stakeholders in each of the countries and map the current operating environment for policy development and implementation. Interviewees were selected based on their affiliation with public sector, private sector and civil society actors. The aim was to achieve a balance between the different sectors. The report is not a comprehensive assessment, but an attempt to generate insights based on the experiences of different stakeholders in the water governance sectors of the four countries included in the study.

3 An overview of the EU policy framework on water

Water policy in the EU has undergone several iterations. Water resources were one of the key issues embedded in the development of the environmental policy framework, which began with hot-spot management and has gradually evolved into a more holistic and integrated approach (EEB 2005). Similarly, the history of water legislation in Europe has moved from targeting specific issues and/or water-related sectors towards a more integrated approach (EC 2012e). Water policy can broadly be divided into two phases. The first phase, between 1975 and 1990, led to:

- The Dangerous Substances Directive
- The Drinking Water Directive
- The Freshwater fish Directive
- The Shellfish Directive
- The Bathing water Directive
- The Groundwater Directive

The second phase began around 1991 and led to:

- The Urban Waste Water Treatment Directive

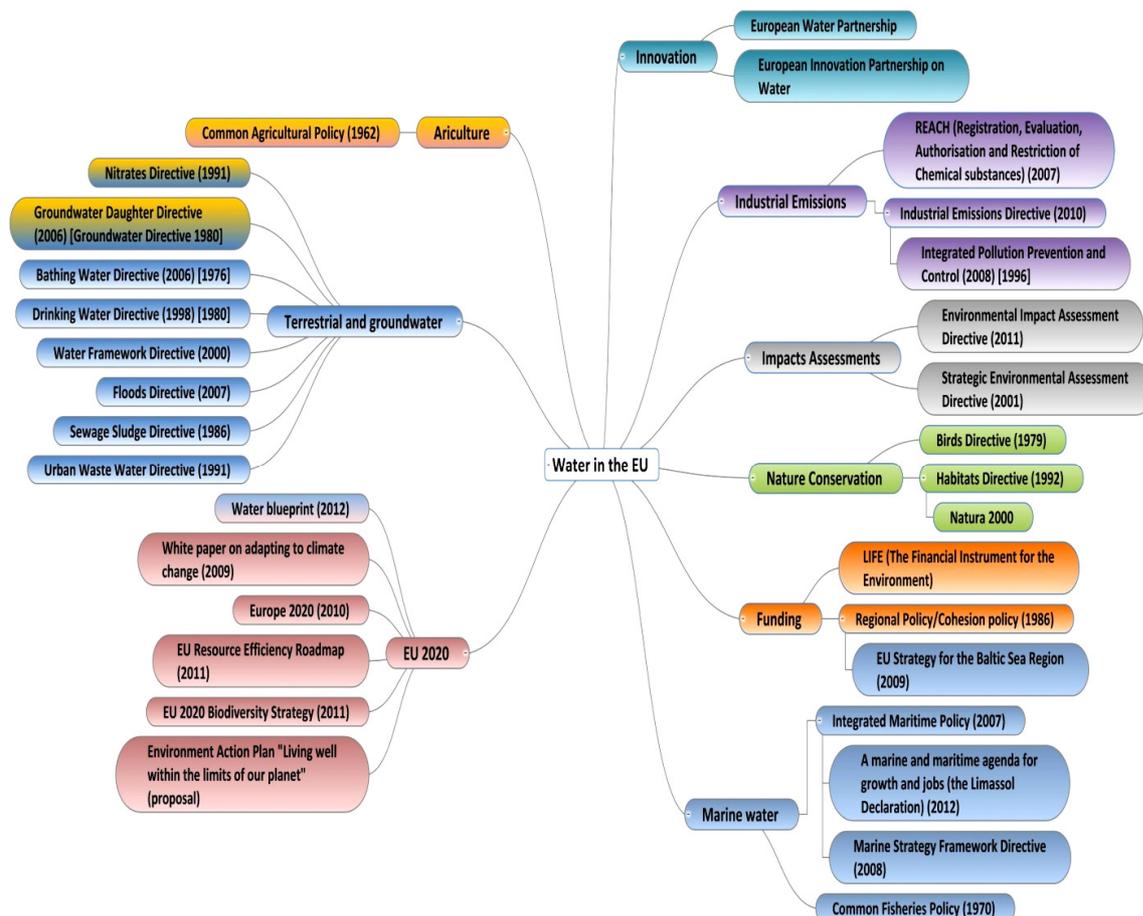
- The Nitrates Directive
- A new Drinking Water Directive
- A Directive for Integrated Pollution and Prevention Control

In the mid-1990s, pressure increased for a fundamental rethink of EU water legislation. There was a recognized need for a global approach to water policy that addressed the increasing water awareness among citizens and other stakeholders, and approached the management of water in a more coherent way. Even though considerable progress had been made in addressing individual water-related issues, water policy had to become less fragmented in both its objectives and its means.

The WFD replaced a number of directives from the early phase of EU water legislation, most notably the Groundwater Directive and the Dangerous Substances Directive. Some of the directives from the early 1990s, including the Urban Waste Water Directive and the Nitrates Directive, will be revised and their requirements coordinated with River Basin Management Plans (RBMPs) – a central tool of the integrated approach in the WFD (EEB 2005).

Figure 2 demonstrates the plethora of policies linked to water in the EU today. This is not a comprehensive inventory of all the relevant legislation and strategies, but an example of how complex the system of policies is. These directives and strategies can be further divided into sub-clusters, depending on their focus (see Figure 2).

Figure 2: European policies linked to water resource management



Source: Stockholm Environment Institute 2013

Directives directly linked to the protection of water quality and supply are organized around clusters. There is one for the marine environment, with the Marine Strategy Framework Directive (MSFD) as the central legislation, and one for terrestrial water, organized under the WFD. As is mentioned above, many of the earlier directives focusing on specific water issues have been replaced or reframed by the WFD, while the MSFD emerged from a need to address the continued degradation and overexploitation of the resources of the seas. In addition, the MSFD is the environmental pillar of the overarching Integrated Maritime Policy, which also has an agenda for blue growth and jobs (the Limassol Declaration). Another important cluster is the directives or agreements on nature conservation, including the protection of important marine sites, to which the Birds and Habitats Directives are central together with the MSFD. There are also directives without a specific water focus that are important to the success of both the WFD and the MSFD, such as the Common Agricultural Policy and the Nitrates Directive. In addition, the cohesion policy together with other funding mechanisms, such as the EU financial instrument, LIFE, are crucial to achieving the technological or other advances needed to reach the goals set in the MSFD and the WFD.

The EU 2020 strategy calls for sustainable growth. It is important to investigate whether the “water protection clusters” and the policies aimed at blue growth are in synergy or conflict with each other on different levels, from goals to implementation, if they are to be successfully implemented. The Water Blueprint is the implementation plan for the WFD to 2020. It seeks to link the terrestrial and groundwater protection clusters with the EU 2020 cluster, and its timeframe is closely related to the EU 2020 Strategy and, more specifically, its Resource Efficiency Roadmap.

4 Background on the four case study countries

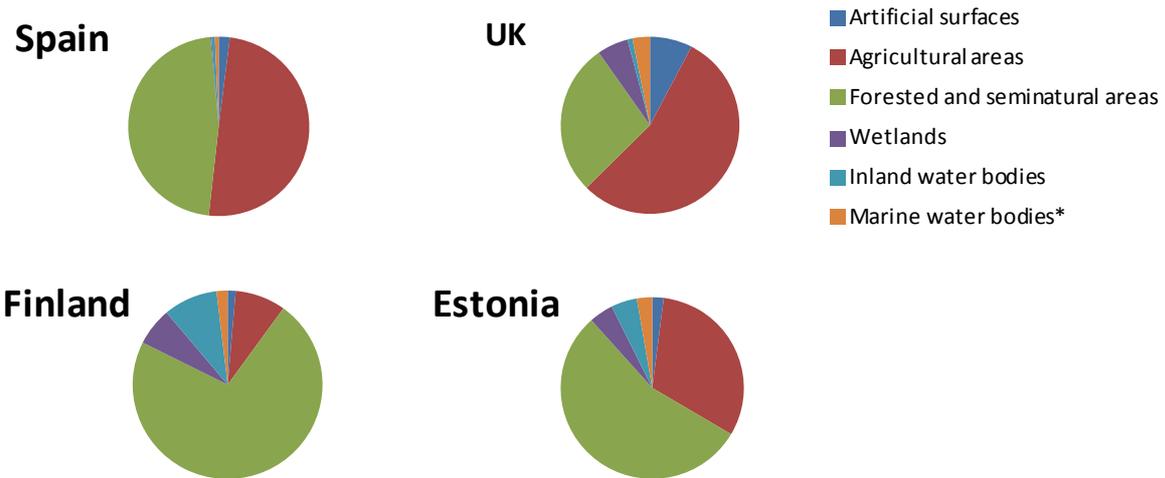
The four countries included in this study vary in terms of climate regime, land use patterns, pattern of water resources and management, political systems and socio-economic status.

When compiling the data for the figures and national tables, we have tried as far as possible to use the same databases to allow for cross-country comparisons. Much of the information is from the EU’s statistical database, Eurostat, or the database for WFD monitoring, WFD WISE. The data in Eurostat are sometimes less up-to-date than the data in national statistics. WFD data also differ in definition according to national monitoring strategies, leading to inconsistencies (see below). If data were unavailable for one or several of the countries, other databases were used as a substitute. This mainly applies to water abstraction accounts, which are derived from the UN statistical database.

4.1 Water abstraction, protection and quality in the pilot countries

Figure 3 shows that the distribution of land cover differs significantly between the four countries, which has implications for how water-related problems are formulated.

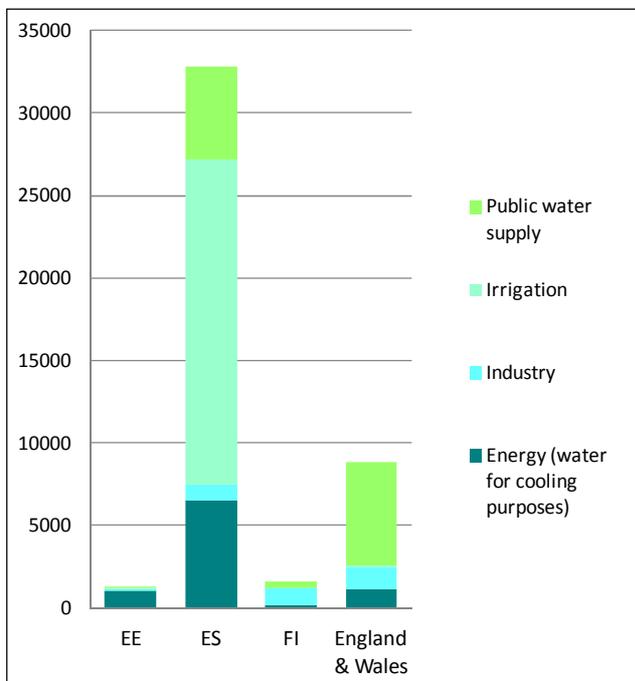
Figure 3: Land cover distribution in the four countries



Source: EEA (2006)

Finland stands out for its high proportion of forested land, while the UK and Spain have a much larger area of agricultural land. The amount of inland water is high in Finland, and more limited in the UK and Spain. Moreover, the proportion of artificial surfaces, which include the urban fabric, is significant in the UK. All these patterns give rise to different challenges for water governance.

Figure 4: Water abstractions for irrigation, manufacturing industry, energy cooling and public water supply (million m³/year), 2002–2007

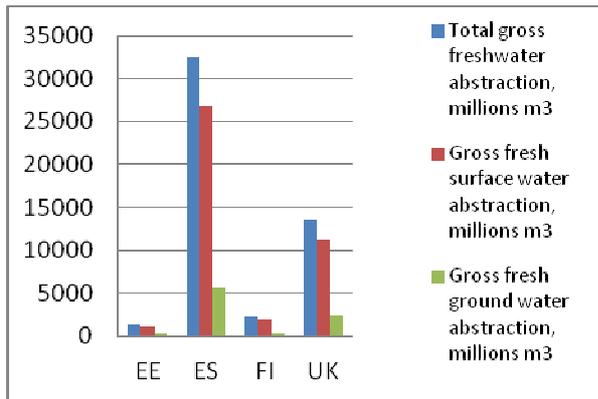


Source: EEA 2010

Figure 4 shows that water abstraction for different purposes differs significantly among the countries. It is not surprising, given Spain's climatic location and high amount of agricultural land, that water use for irrigation is much higher than in any of the other countries, while England and Wales together with Spain lead on water abstraction for the public water supply.

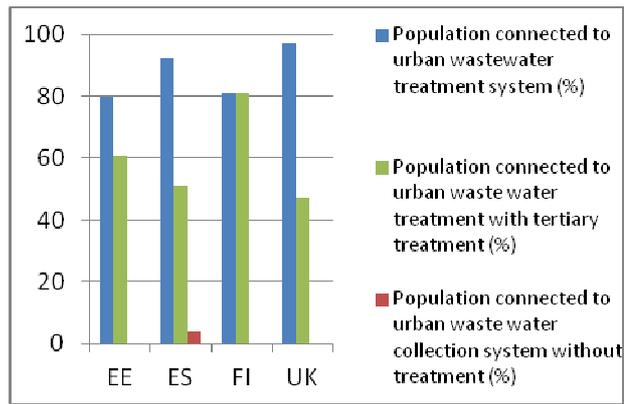
However, population levels must be taken into account. Comparing water abstraction per capita in the country-specific tables, water use for industrial purposes shows less variation but water use for cooling purposes in energy production is higher in Spain (see Figure 4). However, these rankings would probably change if water use across the whole energy sector, including hydropower, were taken into account.

Figure 5: Annual water abstraction



Source: Eurostat, 2009

Figure 6: Population connected to wastewater collection and treatment



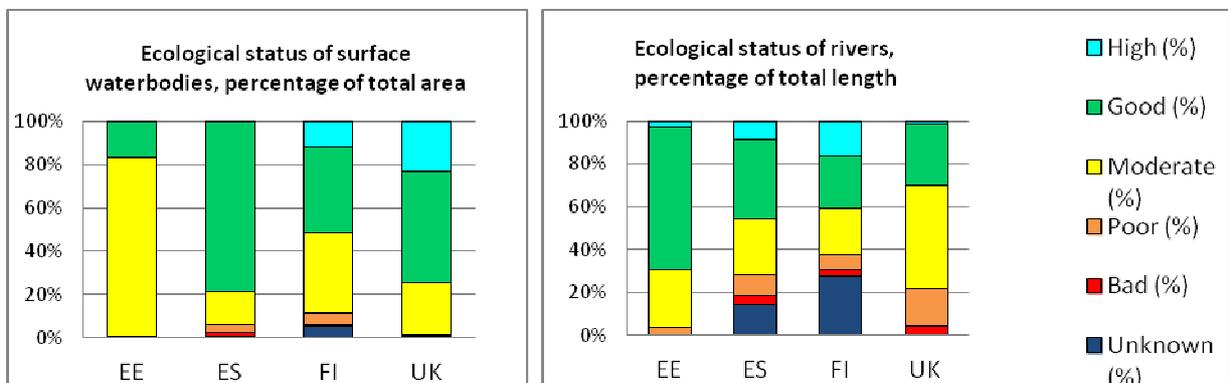
Source: United Nations Statistics Division, 2010b

The amounts and sources of freshwater abstraction also vary between the countries, as is shown in Figure 5, even though all countries take their largest share of freshwater from surface water. Spain extracts more groundwater than the entire water abstraction of Estonia and Finland. However, Spain has a larger population and surface area (see table 1).

All the countries have a fairly high percentage of the population connected to urban waste water treatment systems, but the figure for Finland should be treated with caution as it is the most recent report to Eurostat from 2002. Larger differences between the countries can be found in the proportion of the population connected to sewage treatment. Finland has the highest proportion among the four countries, and all of its urban waste water receives tertiary treatment that represents the highest level of sewage treatment. The UK has the lowest level of tertiary connection. Spain is the only country with part of its population connected to an urban waste water collection system that does not involve any treatment.

The WFD obliges countries to monitor and report on water quality and quantity. The data reported from the different countries are fairly inconsistent, however, as the WFD allows them to use different scales of minimum mapping units etc. For more information on this (see section on Data Inconsistencies).

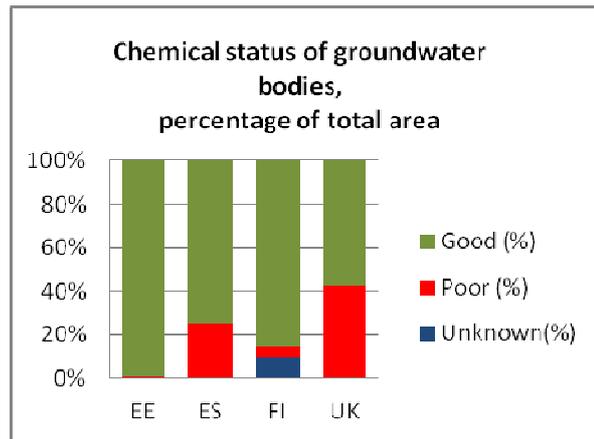
Figure 7: Ecological status of surface water



Source: EEA, 2009b

The overall status of rivers shows larger differences than water quality reported by area (i.e. including lakes, transitional and coastal water as well as large rivers). The amount of water of high quality is larger, but also the amount of poor. Moreover, the number of water bodies with unknown status also increases. The chemical status of groundwater has fewer categories. Both the UK and Spain report a large amount of poor quality water. Finland has the largest proportion of water of unknown quality, while Estonia reports a pattern of high quality.

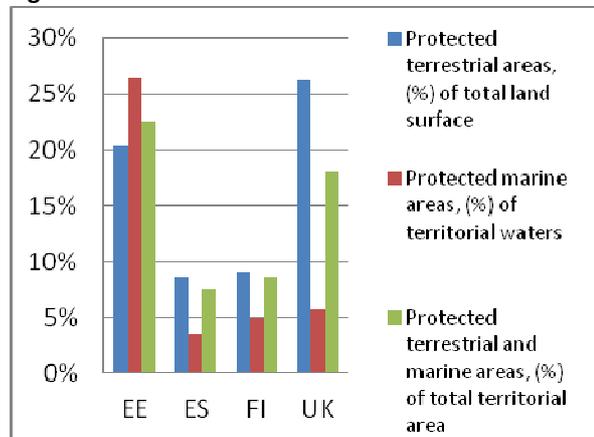
Figure 8: Chemical status of groundwater



Source: EEA, 2009c

The extent of protected areas in the countries varies depending on whether they are terrestrial, marine or the total of both. The UK, for example, has a high prevalence of protected terrestrial areas, but much less marine protection. This could be explained by the different definitions of protected areas used. However, it still has the second highest amount of protected marine areas as a proportion of territorial waters. Both Finland and Spain have significantly fewer protected areas, while Estonia has the highest protected total and marine area.

Figure 9: Protected areas



Source: United Nations Statistics Division, 2010a

4.2 Data inconsistencies

Under the WFD, water monitoring is included in the River Basin Management Plans. The approach taken can differ between countries. The WFD describes two systems for EU member states to choose from. System A has a defined minimum mapping unit for water bodies, while System B allows countries to establish a system according to their own preferences, as long as it publishes the defining features of the water bodies (EC 2000). The four countries in this study have all chosen different approaches, which makes comparisons complex. Estonia and the UK (excluding Northern Ireland, which has a smaller minimum mapping unit) report using system A (EC 2012d, EC 2012b), while Finland has adopted system B and defined the minimum mapping unit as larger than it would be according to System A (EC 2012c). This is outlined as a weakness in Finland's River Basin Management Plan that will be revised for the upcoming period (ibid.). Spain does not provide information on the size of the units that have been mapped (EC 2012a). How groundwater bodies are identified and measured is unclear in both the WFD text and the countries' different RBMPs (EC 2000, EC 2012a,b,c,d). The coverage in the different countries therefore varies, leading to different degrees of reliability in the assessments.

In addition, the measures for establishing the limits of coastal waters for the CORINE land cover data base have been found to be inconsistent in national declarations (European Commission DG ENV, 2011).

5 Water Governance in Spain

The political history and the geographical context of Spain are two important factors to be aware of when analysing water governance. Spain was a totalitarian state for more than 40 years until the mid-1970s. A strong decentralization process was then initiated. Spain is now divided into 17 Autonomous Regions (Figure 10), but remains strongly centralized in some areas. Water is one of these. Spain's position on the Iberian Peninsula on the western part of the Mediterranean Sea explains its predominantly warm and dry climate. A more precise picture is of three main climate zones: the north-western part with a mild and humid oceanic climate (annual precipitation of 900–2000 mm); the inland region with its continental climate characterized by warm summers and cold winters (precipitation of 300–600 mm); and the Mediterranean coastline and the Canary Islands, with warm summers and mild winters (precipitation of 100–800 mm). Table 1 provides data on Spain's water resources.

Figure 8: Autonomous Regions of Spain



Source: www.osha.europa.eu

5.1 Water resources for people and nature

The warm and dry Mediterranean climate places water resources high up the political agenda. Water politics are dominated by water supply, i.e. providing water for human activities, and the highest priority is usually the provision of water for the agricultural sector, which represents about 70% of anthropogenic water consumption (Chico and Garrido 2012). Spain was a pioneer when it comes to planning and managing water using a water basin approach. The first water basin organizations were established in 1926, under the authority of the state. The focus of these organizations was to guarantee the provision of water in response to user demand, through investment in huge infrastructure projects. Today, Spain has about 1200 large reservoirs and water transfer systems between major river basins.² The production of energy through hydropower plants is an important driver of infrastructure investment. About 25% of the water extracted in Spain is used for hydropower (Hardy and Garrido 2012). Criticism of productivity-oriented water politics has

² <http://www.eea.europa.eu/themes/water/european-waters/reservoirs-and-dams>

increased in recent years, and it has also generated conflict between different regions. An indication of the strong technical focus is the fact that water policy in Spain was under the direction of the Ministry of Public Works until the mid-1990s, when it was transferred to the Ministry of the Environment (Vera 2009). The first steps towards including an ecological dimension in water politics came with the implementation of the EU WFD (De Stefano and Hernández-Mora 2012). In addition to surface water, groundwater is also an important source of irrigation for the agricultural sector. Constant high demand and scarce water resources have contributed to the use of alternative sources of supply, such as reusing wastewater and the desalinization of sea water.

Other important water users are the municipalities, for the provision of water to human settlements, and industry (see Figure 4 for water consumption shares between different sectors). The coastal regions in particular have faced high pressure from urban development and tourism.

Table 1: Country specific information

Total population ^A	46 196 276
Population density (per square kilometers) ^B	91.8
Urban population, percentage ^C	77.4
Surface area square kilometers ^C	505 992
Length of coast , kilometers ^D	4 964
Area of coastal and transitional water bodies, square kilometers ^E	1 615 004
Number of river water bodies ^E	4 298
Total length of river water bodies, kilometers ^E	74 834
Number of lake water bodies ^E	327
Total area of lake water bodies, square kilometers ^E	5 281
Total area all surface water (rivers, lakes, transitional and coastal waters), square kilometers ^F	5 554 483
Number of river basins ^G	25
Number of shared river basins ^G	6
Annual renewable fresh water resources (precipitation and external inflow less actual evapotranspiration), millions of cubic meters ^H	111 133
Total gross freshwater abstraction, millions of cubic meters ^I	32 466
Freshwater abstraction per capita, cubic meters (Total gross freshwater abstraction divided by total population)	703

Sources: ^AEurostat, (2012), ^BEurostat, (2010), ^CUN data, (2013), ^DCIA, (2009), ^EEEA, (2009a), ^FEEA, (2009b), ^GEC, (2012a), ^HEurostat, (2013), ^IUnited Nations Statistics Division, (2010b).

Spain has one of the highest levels of biodiversity in habitats and species in the EU – a richness that can be explained in part by its location between two continents and two seas, the nature of its soil, its topography and the long history of intensive human land use (Fuente 2010). Despite the focus on water for productivity, Spain has large nature reserves in the form of wetlands protected by the Ramsar Convention and areas protected under Natura 2000. The Natura 2000 areas cover 155 064 km² and the Ramsar sites³ an area of 3 031 km² (Fuente 2010).

Land abandonment and afforestation have resulted in significant revegetation in large areas of Spain. It is interesting that these processes are not exclusively considered for their positive benefits, but can

³ http://www.ramsar.org/cda/en/ramsar-documents-list-anno-spain/main/ramsar/1-31-218%5E16188_4000_0_

result in competition for water availability. Land abandonment and afforestation are estimated to reduce the annual availability of blue water by up to 4%, decreasing volumes in rivers and other water bodies (Willarts 2012). Although this may have positive impacts on soil erosion, environmental flow and from a climate change perspective, it reduces the water available for agriculture, domestic use and hydropower generation.

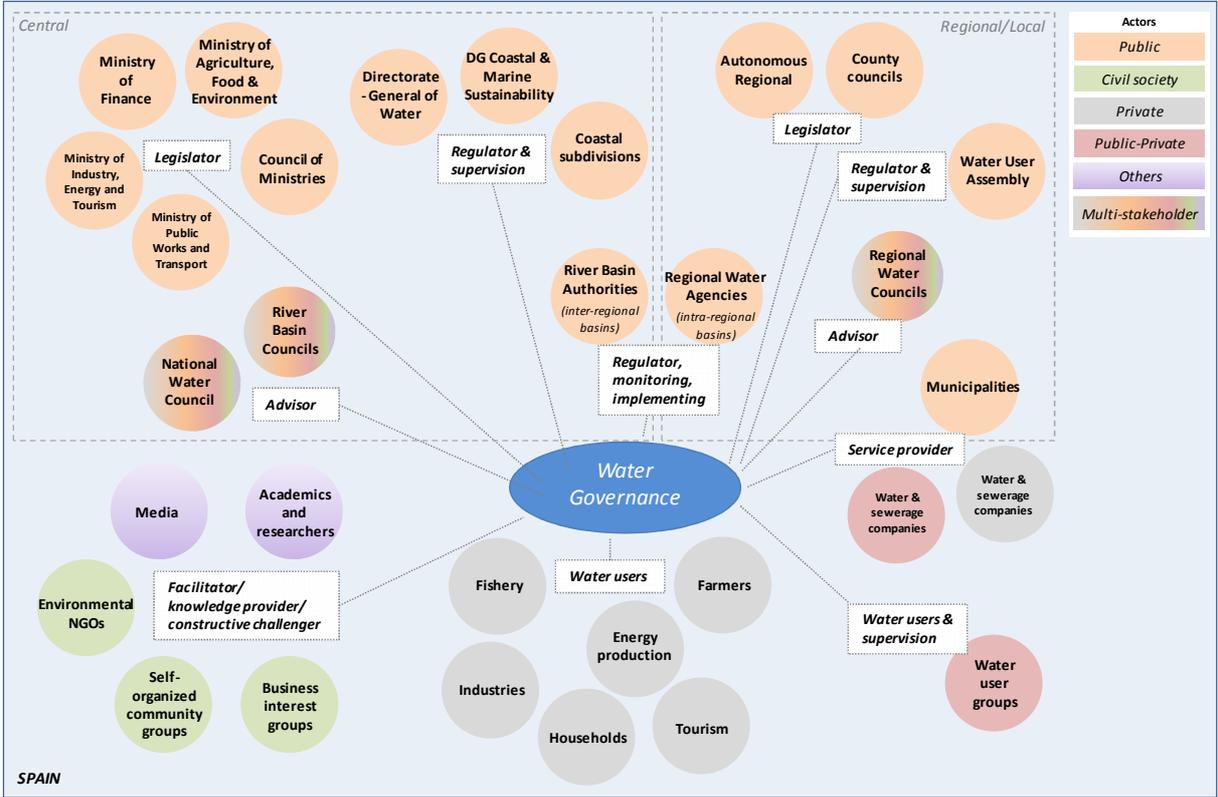
The key issues for water resources in Spain identified from the interviews and the literature are:

- High consumption demand, especially for agriculture
- Severe droughts and floods
- Pollution from municipal wastewater, industry and the agricultural sector
- Hydrologic intervention in river beds due to dams and canalization
- High urbanization pressures in coastal areas

5.2 Institutional overview and key actors

According to Spanish law, water is a public good over which the state has ultimate authority. It is not permitted to make use of water resources without the authorization of the State. *The Secretary of State for the Environment*, within the *Ministry of Agriculture, Food and the Environment*, is responsible for directing and coordinating national environmental policies, including policies related to water resources. However, the management of water resources is both centralized and decentralized, where marine and inter-regional waters are managed by the central authority and intra-regional waters by the autonomous regions. Figure 11 is an institutional overview of water governance in Spain, showing the key stakeholders and their roles.

Figure 9: Division of roles and responsibilities among key actors and institutions – Spain



Source: Stockholm Environment Institute 2013

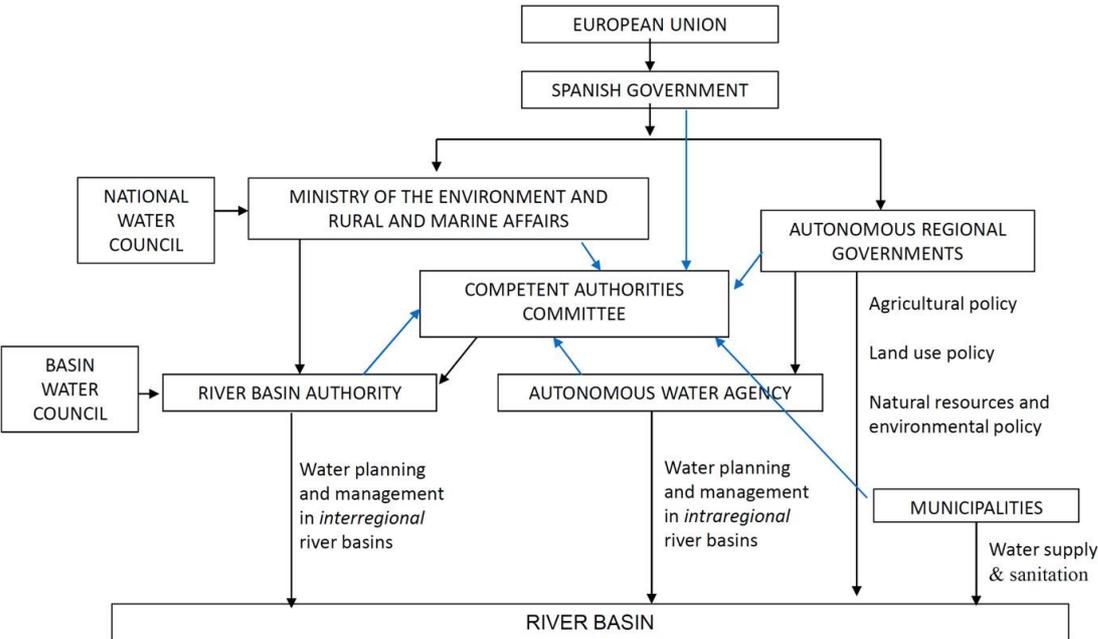
The Ministry of the Environment merged with the Ministry of Agriculture in 2008, and the new Ministry of Agriculture, Food and the Environment was established with the aim of integrating environmental issues into other policy areas. This integration has not been optimal from a water conservation point of view according to some of the interviewees, since the agricultural sector is very strong in Spain. One of the most important platforms for the participation of the social and business sectors in the development and monitoring of general environmental policies is the *Environmental Advisory Council*.⁴ The Council was created to enable public participation in the preservation of the natural heritage and biodiversity. It has 15 members representing NGOs, trade unions, businesses and farming associations, among others. Members are appointed for a two-year term. The Spanish Municipal and Provincial Authorities' Federation participates as an observer.

A *National Water Council*, on which ministries, agencies and sectors are represented, has been instigated to ensure cross-cutting coordination of water policies. The main function of this Council is to advise the Ministry on water planning and management.

- *Surface water and groundwater*

Terrestrial water resources are governed centrally by the Directorate-General of Water under the Ministry of Agriculture, Food and the Environment. Authority over water is divided into major catchment areas and River Basin Districts. If a river basin crosses a regional border it falls under the jurisdiction of the central state and the water is administered by a River Basin Authority. If a river basin area does not cross a regional border, it is administered by an autonomous water authority. Spain has nine autonomous Regional Water Agencies and 16 River Basin Authorities (see Figure 12). The 16 River Basin Authorities cross eight autonomous regions. Groundwater became a public good in 1985, and today authority over groundwater and surface water is connected within the respective River Basin Authorities or Regional Water Agency.

Figure 10: Institutional arrangements for terrestrial water management - Spain



Source: Hernández-Mora 2010

⁴ Consejo Asesor de Medio Ambiente – CAMA

Every inter-regional water basin has its own state-run *River Basin Authority* with a headquarters in the catchment area. These river basin authorities only have authority over the area directly connected with the public water domain – five metres on both sides of the average flood in recent years – and control over land use in a buffer area 100 metres on either side of the river banks. They generally have no say on land use regulation or nature protection in the remainder of the catchment area. The regional autonomous regions have authority over water, land-use and environmental planning and management in their catchment areas, facilitating more integrated water governance.

The River Basin Authorities or the Regional Water Agencies are in charge of the elaboration of River Basin Management Plans and Programme of Measures with the participation of private and public sectors and the civil society. The National Water Council reviews all the RBMPs and the final approval of the plans is given by the Council of Ministries.

Figure 11: Autonomous regions and river basin districts. Inter-regional and intra-regional (dark grey) river basin districts - Spain



Source: Danés, 2012

River Basin Management Plans are developed at the basin level, while the National Water Plan is designed and implemented at the national level (as set out in the National Water Law). The National Water Plan is the responsibility of the Directorate-General of Water. The National Plan must harmonize all regional plans and achieve coordination between the different regional RBMPs. Inter-basin water transfers are a priority area but, according to the interviewees, there is no plan for how to integrate these two planning levels.

Spain created the *Committee of Competent Authorities* as a coordinating body to facilitate cross-level integration according to the requirements of the WFD. It includes representatives from the national, regional and local administrative levels, as well as the ports and coastal management (De Stefano and Hernández-Mora 2012).

Water and sanitation services are provided by the municipalities, but services can be operated by the private sector, the public sector or consortiums of municipalities. Public, private and collective water rights require concessions from the competent water authority. The use of desalinated water and reuse of wastewater also require public water concessions. However, many traditional irrigation schemes have not obtained formal concessions (López-Gunn et al. 2012a).

- *Coastal and marine waters*

Coastal and marine water resources are governed nationally by the Directorate-General for Coastal and Marine Sustainability in the Ministry of Agriculture, Food and the Environment. Authority over the coastline is shared. Spatial planning in the littoral zone is undertaken by the autonomous regions and the municipalities, but the award of concessions comes under the authority of the Directorate-General for Coastal and Marine Sustainability. Administration is divided into coastal sub-divisions with state-operated offices that coordinate with regional and local authorities on measures to improve the sustainability of the coast and the sea, and ensure the integrity and appropriate conservation of the shoreline.

The governance of marine water has been sectorized, and each sector (e.g. shipping, fishery, ports) has its own system for environmental regulation and management. Spain has recently divided its marine waters into five subdivisions as part of the ongoing implementation of the Marine Strategy. Each subdivision will have a Monitoring Committee with representation from the central state administration, the autonomous regions and the coastal subdivisions. The elaboration of marine strategies will be coordinated among the Ministry of Agriculture, Food and the Environment, the Spanish Oceanographic Institute, the Spanish Centre for Public Works Studies and Experimentation (CEDEX) and the Inter-ministerial Commission for Marine Strategies. A monitoring committee, representing the marine sub-divisions, autonomous regions and DG Coast and Marine, and platforms for technical and public participation will also be created.

- *Civil society and public participation*

Spain has obligations to consult the public as stipulated in the EU directives WFD, Strategic Environment Assessment (SEA) and Environmental Impact Assessments (EIAs). However, public participation is a new concept in Spain and the authorities are still on a learning curve. Public consultation on new water infrastructure projects is mainly conducted in two phases, according to the basic requirements of the EU directives: a pre-consultation followed by a consultation when the plans and alternatives have been elaborated.

The *Water Basin Councils* under the Water Basin Authorities are an important instrument for stakeholder involvement in water management. The *Council of Ministers* decides the composition of these councils in each inter-regional river basin district, based on provisions in the National Water Law. Organizations representing environmental and socio-economic interests have only limited representation (2-3%), while the different, mainly productive, user groups (e.g. irrigation groups, hydropower, municipalities) have much stronger representation (c. 35%) and power in the decision-making process (Hernández-Mora et al. 2010). The main influence on new water projects by public and community groups is through campaigns and demonstrations, not normally through the formal institutional system. Civil society representatives from environmental and social NGOs, play an important role as constructive challengers. An example is *COAGRET - Coordinators of People Affected by Large Dams and Water Transfers*, who actively seeks to prevent large-scale infrastructure projects with severe negative impacts on nature and communities, and instead, promote more sustainable alternatives.⁵

⁵ <http://www.coagret.com/>

5.3 Overview of key policies and strategies

Scarcity and unequal distribution have made water politics an area of intense political debate in Spain. This has a direct consequence on the durability and success of policies and strategies, due to frequent changes in policy or the lack of political will to pursue implementation when the country experiences changes in government after elections.

Spain is one of few countries to have a legal requirement for a national water strategy. This offers the foundation for a coherent, goal-oriented vision through a **National Water Plan** (López-Gunn et al. 2012a). The first plan was elaborated in 1933 and the most recent in 2001. The basic scope of the 2001 National Water Plan is:

- Coordination of RBMPs
- National water problems
- Proposing solutions from alternative proposals
- Establishing conditions for water transfers
- Structural updates

The **White Paper on Water in Spain** aimed to achieve a better understanding of pressing water issues. Expected developments, priorities and water use options were established to support the drafting of RBMPs (Ministry of Environment 2000).

A **Sustainable Development Strategy** was approved by the Spanish Council of Ministries in 2007. The main environmental concerns expressed in the strategy were: rising emissions of greenhouse gases, air quality, water stress and water quality, unsustainable consumption patterns, loss of biodiversity, land degradation and the generally unsustainable use of natural resources. The precautionary and polluter pays principles were mentioned, as was the promotion of participation by citizens, companies and social interlocutors in decision-making processes. It proposed that traditional approaches to “supply” should be replaced by demand management strategies to ensure environmental sustainability and the quality of water resources. This change of focus was introduced by the **Water Management and Use Action Programme** (AGUA programme), launched in 2004. The programme aimed to shift to more local/regional self-sufficiency and avoid large-scale transfers between regions. It also promoted the construction of desalination plants, which has been a controversial theme, mainly in relation to the energy intensity of desalination and concerns over the environmental impacts of the high salt concentrate and other waste products.

The legal framework used by the central government to set the direction of water management in terrestrial areas is the **National Water Law** (1985, as amended in 1999 and 2003), which contains the basic regulations on and planning for surface water and groundwater, including:

- General water objectives (e.g. environmental)
- The implementation of the WFD
- Water planning through the National Hydrological Plan and RBMPs
- Management of actions by water bodies
- Quality and efficiency norms (water use and effluents)
- Control and supervision

The autonomous regions have their own regional water laws for the intra-regional basins, adapted to their specific conditions but in line with both the National Water Law and the WFD.

The National Water Law stipulates a user hierarchy or priority to be considered in water planning:

1. Water supply
2. Irrigation
3. Energy production
4. Industrial uses
5. Aquaculture
6. Recreational uses
7. Sailing and water transport
8. Other uses

This order can be changed in specific RBMPs, but water supply should always be the highest priority (Danés 2012). It is notable that the environmental uses of water are not mentioned in this context.

To achieve good environmental and chemical status for its water bodies, Spain implemented a **National Sewerage and Wastewater Treatment Plan** in 1995. This plan corresponded to the EU Directive on urban wastewater treatment (91/271/EEC) and was subsequently revised to comply with the WFD.

The Common Agricultural Policy is considered instrumental to the agricultural sector in Spain. The Ministry of Agriculture, Food and the Environment is responsible for the **National Strategic Plan for Rural Development**, which provides the overall policy framework, while the autonomous regions set strategies and regulations at the regional level. Consequently, every autonomous region has a Rural Development Programme for their region. As a response to the challenge of water scarcity, a **National Irrigation Plan** has been implemented with the main objective of improving and consolidating the infrastructure for the distribution and application of irrigation water.

According to the National Water Law, river basin authorities are required to develop **Drought Management Plans** and the public administrations responsible for urban supply (to towns exceeding 20,000 inhabitants) must develop **Emergency Plans for Drought Situations**.⁶

Spain is currently implementing different flood management actions, including civil protection against flood risk, territorial planning measures, river restoration and flood prediction systems. The development of regional **Flood Risk Management Plans** according to the recent *EU Floods Directive 2007/60/EC* will support the coordination and integration of flood risk measures.

The Directorate-General of Water is developing a **National Plan for Water Reuse**, a new management tool which aims to increase the security of supply and make water use more efficient by replacing natural water sources with reused water.⁷ This will generate new sources of water and save natural water resources for uses that demand higher quality water, while also supporting a general improvement in water status.

Spain shares transnational water basins with Portugal and France. Spain and Portugal have signed the **Albufeira Agreement** to improve management of shared water resources. Apart from ensuring water quality and supply, the agreement aims to improve the administrative and legal coordination in the cross-boundary basins.

⁶ <http://www.magrama.gob.es/es/agua/temas/observatorio-nacional-de-la-sequia/planificacion-gestion-sequias/>

⁷ <http://www.magrama.gob.es/es/agua/participacion-publica/pnra.aspx>

Spain's **Coastal Law** regulates the public domain of the coastal area, but does not cover water or environmental planning. The current coastal law has been criticised by the EU, over legal uncertainty for property owners along the coastline and for not ensuring effective protection of the coastal environment.⁸ The Spanish government has started to reform the coastal law.

Spain is currently implementing a new **Marine Environment Protection Law (2010)**, which is based on the EU Framework Directive on Marine Strategies (*Directive 2008/56/EC*). An initial status analysis has been carried out of the five marine subdivisions. Before 2010, all marine environmental regulations were sectoral and there was no common framework. The new marine law applies to marine water one mile perpendicular to the coastal baseline. If the 'terrestrial' water law cannot guarantee a good environmental state of the marine waters, the marine law expands beyond the coastal baseline. The marine strategy includes the following phases with a six-year planning cycle:

- Initial evaluation
- Definition of a good environmental state
- Establishment of environmental objectives
- Design of monitoring programme
- Elaboration of a programme of measures

5.4 Experience of policy implementation

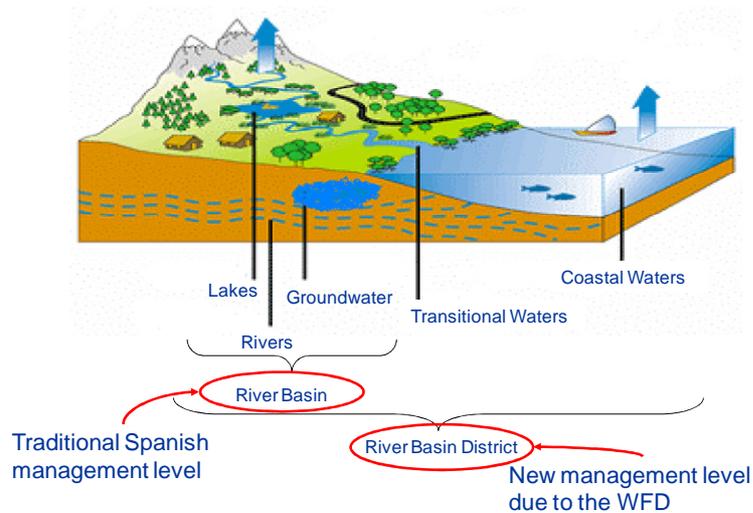
▪ *Implementation of the WFD*

Despite the long tradition of river basin management in Spain, implementation of the WFD has faced many challenges and the EU's timeframe has not been met. Only one of the 16 water basins has had its RBMP approved by the EU. One problem has been the definition of River Basin District and its application to the territory. Some of the autonomous regions designed their River Basin Districts without including coastal and transitional waters (Marcos, 2011), see Figure 14. The challenges identified are of a technical, financial and political nature (Llamas et al. 2012). Political issues include regionalism and the fact that different authorities are responsible for water resources and the environment at the national and regional levels (personal communication; Custodio et al. 2012). In addition, work to achieve the WFD objectives has in some cases been criticised by civil society due to the lack of cost recovery from the agricultural sector and the lack of public participation (Scheuer and Naus 2010).

Spain has given water quality top priority in its programme of measures to implement the WFD. In some river basins, up to 60% of the total budget has been directed to pollution control, e.g. municipal wastewater treatment (personal communication).

⁸ http://ec.europa.eu/unitedkingdom/press/frontpage/2012/12_91_en.htm

Figure 12: Traditional river basin compared to river basin district in the WFD - Spain



Source: Danés, 2012

▪ *Integrated water basin planning and comprehensive participation: The Basque Country Case*

In the Basque country, the government of the Autonomous Region (CAPV) formed a specific entity under the Environment Department to manage water resources: the Basque Water Agency (URA). The URA has delegated the implementation of water policy under its supervision to the Ebro River Basin Agency. Based on the National Water Law and the WFD, the CAPV has stipulated a Regional Water Law. There are three types of forum for regional water governance: Administration Councils (county councils), a Water Council (sector representatives with mainly an information role) and a Water User Assembly (all administrative, with public, private and civil society representation).

The CAPV RBMP is a forward-looking, integrated plan. This is probably because the regional government is also responsible for territorial planning and terrestrial nature conservation. The opposite is the case for the state-run River Basin Authorities in the Inter-regional basins.

Flood management was integrated into the RBMP before the advent of the EU Floods Directive. The flood risk strategy includes the implementation of both structural and soft preventive measures, e.g. the regulation of land use, flow management and early warning systems. A special programme has been implemented to mitigate hydrological and morphological changes that hinder the migration of fauna, e.g. the removal of ancient infrastructure that is no longer in use.

The URA has formulated a sanitation and wastewater treatment plan that, among other things, includes industrial effluents, contaminated soil and sediments, and improved agricultural practices. A priority issue is cost recovery from water supply and treatment. It is currently achieving about 80% cost recovery.

A detailed Programme of Measures has been developed to implement the RBMP, which specifies how it will be financed and who will be responsible for providing the support (e.g. the EU, the state, or regional or private organizations).

Coordination with the agricultural sector: Implementation of the CAP and development of Rural Development Programmes (RDP) are decentralized in Spain, although the allocation of money is managed centrally. In the Basque country, the RDP is managed by the County councils. Good coordination has been achieved between the agriculture department and the URA, which supports

the agricultural sector through water quality monitoring. (A strong monitoring programme is seen as key to improving knowledge of the system and allowing measures to be followed up.) Improvements have been made, to the extent that it has even been questioned whether there is a continuing need for some declared nitrate vulnerable zones.

Participation in water planning: A thorough and participatory planning process, covering all the different phases, was conducted by the URA as part of its elaboration and implementation of its RBMP. A multitude of meetings was conducted. These were:

- Thematic (e.g. floods, contamination, water supply)
- Sectoral (e.g. industry, agriculture, hydropower)
- Territorial
- General (where information was presented in a less technical manner for the public)

To support the involvement of the general public and concerned stakeholders, interactive monitoring data on water quality and the quantity in the basin were made available on the Internet.

As a result of this extensive participatory process the URA was able to obtain new perspectives and correct misconceptions, and there was a significant reduction in the number of objections to the plan (an 80% reduction). This has greatly facilitated implementation.

- *Water and agriculture*

As is noted above, agriculture is an important sector for water management, particularly due to its high share of water consumption. There are two types of farming systems in Spain. The first is greenhouse-based agriculture or cultivation under plastic (e.g. for the cultivation of tomatoes), which is mainly carried out along the Mediterranean coast. This production requires large inputs of water, but is also of economic importance. The second is the cultivation of fruit trees, corn, alfalfa, etc., which does not require the same amounts of water inputs and is more common in other regions of Spain. It is common for water resources to be governed by water user groups. This has a long tradition in Spain.

Water efficiency in irrigation has increased through modernization of the system. Open channel irrigation systems have been replaced by sprinklers or drip-irrigation systems. At the same time, however, it has become more common to have two harvests per year, and so the total amount of water used for irrigation has not diminished significantly. A noteworthy effect of the modernized water supply is an associated increase in energy costs for pumping, which has also contributed to a reduction in water consumption for irrigation.

5.5 Innovations in Spanish water governance

- *Water user groups*

In Spain, almost 60% of irrigated land is managed by irrigation associations (López-Gunn et al. 2013). Spain has more than 1000 years of tradition of surface water irrigation communities. The oldest groundwater user associations have existed for about 40 years, but new forms of user group are emerging based on the use of desalinated water or the reuse of wastewater. Spain has many examples of water user groups, water user communities and irrigator associations (including groundwater, surface, reused water, desalinization) and it has accumulated valuable experience of a range of self-regulation initiatives led by users.

The water user associations have traditionally been involved by the water authorities in the management of communal irrigation systems. Irrigation associations have been a formal part of governance and management structures since the establishment of River Basin Authorities in the 1920s (Hernández-Mora and Ballester 2011).

These water user groups can therefore have a public-private nature and from a legal viewpoint be part of the public administration. Groundwater user groups can play a public role, receiving public funds and administering water as a public good, and they have the authority to impose fines and sanctions (López-Gunn et al. 2013). This role encourages collective action and can strengthen water management, but it is no guarantee of good governance or long-term sustainability. Hence, it is important to ensure transparency in decision-making and the imposition of environmental conditions. The most successful user groups have been able to operate with delegated governmental authority, collecting and handling information that it would be complicated or costly for the river basin authority to manage on its own. This is beneficial for organizing and planning for the sustainable use of the water resources (López-Gunn et al. 2013).

▪ *Water footprint and virtual water studies*

Spain was the first country to include a water footprint analysis into governmental policy making in the context of the WFD. In each river basin district the water footprint of the different socio-economic sectors is to be analysed, i.e. the total amount of used water resources including net domestic import and export (Official State Gazette 2008). In this context, the National Water Plan could play a role since one of its aims is to coordinate water resources between river basins to achieve a balanced planning and management.

In addition, Spain has made significant efforts to study and increase its understanding of water footprints and virtual water at a global level. Decision makers have tended to focus on production-related water issues within their respective territories, without considering the virtual water flows linked to trade in agricultural and industrial products (López-Gunn et al. 2012b). In the debate on global water and food security, it is important to consider the impacts of virtual water imports into third countries. From a water-requirement perspective, Spain can maintain its rate of livestock production thanks to the imports of virtual water embedded in the soybean produced in countries such as Brazil or Argentina (López-Gunn et al. 2012b). Some of the lessons learned from water footprint studies in Spain are (Llamas et al. 2012; López-Gunn et al. 2012b):

- That 10% of the freshwater abstracted from rivers and aquifers produces around 90% of the economic value of Spanish irrigated agricultural production.
- Spain imports water-intensive but low-value products, mainly animal feed and agricultural commodities, and transforms these into high-value export goods, mainly meat and processed products. Dietary shifts have increased the water footprint of an average Spanish diet by 8% over the last decades.
- Changes in the trade in virtual water cushion and respond to falls in agricultural supply caused by droughts.
- Green water (i.e. rainwater stored in the soil) forms an important share of Spain's water consumption. This is normally neglected by governments in both traditional statistics and most national and river basin plans.

- *Water trading*

One instrument for coping with water scarcity in Spain is water trading, using market mechanisms to value water resources and provide compensation through voluntary transfers of water rights or water use rights. In 1999, the Spanish Water Law was reformed to allow water rights holders to exchange water resources (Garrido et al. 2012). The establishment of water markets could be a potential alternative for improving the economic and efficient use of water. Many different set-ups have been applied in Spain, including informal exchanges, trading in private groundwater rights, formal lease contracts and trading in public concessions, inter-basin trading and water exchange centres, where water agencies purchase water for environmental or urban uses.

The following conditions apply to trading in and markets for water supply (Danés 2012):

Transfers between individual users:

- These must be temporal transfers of water use rights between users that already have water use rights;
- The transfer has to respect the hierarchy of water uses, that is, it must be for an equal or superior use;
- Only the Ministry of Agriculture, Food and the Environment can approve an alteration in the hierarchy;
- There must be a financial exchange agreement.

Water trading centres:

- These are temporal or permanent transfers of water use rights to the River Basin Authority;
- The River Basin Authority makes public offers at a specific price;
- These are only applicable in exceptional situations (e.g. droughts, overexploited aquifers);
- The River Basin Authority can decide what to do with the rights it has acquired. It has no obligation to transfer them again.

6 The United Kingdom

6.1 Historical trends for water governance in England and Wales

Water governance in England and Wales has undergone major changes over the past 50 years. Multifunctional regional-scale water authorities have been created and abandoned, supply management has been privatized, and river basin management and the EU WFD introduced as guiding frameworks (Watson et al. 2009). The changes in the relationship between state and non-state actors are probably the most fundamental. Privatization in England and Wales in the 1980s is a typical example of introducing markets to environmental resources. The changes were one expression of the shift to neoliberalism under Prime Minister Margaret Thatcher in the 1980s.

What these changes really meant for management roles and responsibilities, and implementation practice is open to debate. Some argue they represented a shift from government to governance, while others say they have had little impact and have done little to reduce asymmetrical power relations or facilitate true collaborative governance (Watson et al. 2009). The road to today's governance arrangements is briefly outlined below.

At the beginning of the 20th century, water management in England and Wales was localized and fragmented. To improve efficiency and effectiveness, the river basin was adopted as the planning unit and responsibilities shifted from local authorities to new water bureaucracies under central government control. Multi-purpose river basin management and River Boards were created in 1948. In 1963, River Authorities were created and given powers that extended to water resource development and abstraction. However, overall responsibility and control remained with central government (the Ministry of Agriculture, Fisheries and Food and the Ministry of Housing). Under this approach, the influence of local authorities was further reduced, as they lost responsibility for water supply.

Different aspects of river basin management were handled by different bodies and central government found it difficult to handle water issues in the light of population increases. The 1973 Water Act fundamentally changed water management, establishing regional, river-basin based and multifunctional water authorities with responsibility for water conservation, water supply, sewerage and sewage-treatment, pollution control, flood alleviation, land drainage, recreation, fisheries and navigation. A holistic institutional approach had been introduced, but these institutional changes definitively removed water management from local government responsibility, while central government control again increased (Watson et al. 2009).

The water supply and sewerage functions were sold to private water companies in 1989.⁹ Under the established river basin approach, the boundaries within which each water company was to operate were defined according to hydrological boundaries, and remain so today. In part, privatization sought to reduce the government's role in water management, but the need to regulate a market that lacked competition required new public sector functions to be established. The Department for the Environment, Food and Rural Affairs (Defra) was given policy responsibility and remained in control of water resources management. Ofwat was established to function as the economic regulator of the water and sewerage companies, which returned power to the state. Watson et al. (2009) conclude that despite these institutional changes, central government has increased its control as private companies are responsible for the delivery of water but policymaking and regulation remain with

⁹ *Interview with Environment Agency representative*

central government through “niche” organizations under its control (Watson et al. 2009). Although views on the effects of privatization differ, interviewees agreed that the government plays a profound role in water governance as the water industry is heavily regulated. An important aspect of the privatization reform is that it separated responsibility for the protection of water resources from the abstraction of water.

6.2 Water resources for people and nature

The coverage of water supply and sanitation services in the UK is universal. There are, however, variations in terms of water availability, and reliable supplies of water for abstraction are not available in some areas (Environment Agency 2012). Future pressures include population growth and climate change. The United Kingdom has 17 river basins, three of which are shared with the Republic of Ireland: Neagh Bann, North Western and Shannon (European Commission 2012).

Table 2: Country specific information

Total population ^A	62 989 550 (56 100 000 in England and Wales)
Population density (per square kilometres) ^B	254.2
Urban population, percentage ^C	79.6
Surface area square kilometres ^C	242 900
Length of coast , kilometres ^D	12 429
Area of coastal and transitional waters, square kilometres ^E	67 115
Number of rivers ^E	9 080
Total length of rivers, kilometres ^E	99 749
Number of lakes ^E	1 119
Total area of lakes, square kilometres ^E	1 933
Total area all surface water (rivers, lakes, transitional and coastal waters), square kilometres ^F	69 049
Number of river basins ^G	17
Number of shared river basins ^G	3
Renewable fresh water resources (precipitation and external inflow less actual evapotranspiration), millions of cubic metres ^H	164 280
Total gross freshwater abstraction, millions of cubic metres ^I	13 649 (England and Wales)
Freshwater abstraction per capita, cubic metres (Total gross freshwater abstraction divided by total population)	243

Sources: ^AEurostat, (2012), ^BEurostat, (2010), ^CUN data, (2013), ^DCIA, (2009), ^EEEA, (2009a), ^FEEA, (2009b), ^GEC, (2012b), ^HEurostat, (2013), ^IUnited Nations Statistics Division, (2010b).

In 2011, 11.399 million cubic metres of non-tidal surface water and groundwater was abstracted in the UK, which is a reduction from 15.063 million cubic metres in 2000. The volumes shown in Table 2 are from 2010. They are provided to allow comparison with the other case studies¹⁰ (United Nations Statistics Division 2010b). Of the water abstracted, approximately 85 % was used for public water supply¹¹ (51%) or to support electricity supply to industry (34%). About two-thirds of the public water

¹⁰ Note that data are taken from different sources and definitions may vary.

¹¹ According to the 1991 Water Act “public water supply” is water provided for the purposes of drinking, washing, cooking or food production (by an appointed water company), it thus includes water for household and business customers.

supply was used by households in 2011 (Defra 2011). Use differs between regions. In Wales, over 80 % was used to support electricity generation and less than 15 % was taken for public water supply (Environment Agency 2012). Household demand has been increasing since the 1950s while demand from heavy industry has been declining. Other main water uses include “other industry” and fish farming. Fish farming uses 15–20% and the manufacturing sector 10-15 % of the total water used. Approximately 12 % is used for agriculture (Defra 2011, Defra 2012).

Annually, about 6.3 billion cubic metres of water is used for businesses in England and Wales (2006–2007 figures). About 70 % of the water abstracted by companies from non-tidal waters is returned as treated effluent (Environment Agency 2008).

The role of ecosystem services in water governance is now being addressed. According to the 2011 UK National Ecosystem Assessment, open waters, wetlands, floodplains, coastal margins and marine areas in England and Wales contribute provisioning services, such as food, water, navigation and bioenergy; regulating services, such as climate regulation, water quality regulation and maintaining wild species diversity; and cultural services, such as recreation, health benefits, aesthetic value and education (UK NEA 2011). In urban areas in particular, ecosystems have been heavily modified and provision is likely to be further affected by climate change.

6.3 Institutional overview and key actors

Water governance in the UK as a whole has a complex structure. The Government of the United Kingdom of Great Britain and Northern Ireland is the central government, but responsibility is devolved to three of the four regions: Wales, Northern Ireland and Scotland. England is the exception as it does not have a devolved parliament. Within these regions, different approaches are taken to collating statistics and governing water resources, e.g., responsibility for water supply and sanitation remains with public agencies in Scotland and Northern Ireland. Even though a UK-wide approach is taken to implementing central government policies and EU Directives, four different administrations implement the WFD (the British Government, the Scottish Government, the Northern Ireland Assembly and the Welsh Assembly). Official documents, such as the *Commission’s report to the European Parliament and the Council on the implementation of the Water Framework Directive*, account for implementation progress of the different administrations are differentiated between but accounted for in the same UK document. The UK Technical Advisory Group for the WFD (TAG)¹² has been set up by the different UK administrations as a partnership of the different UK environment and conservation agencies to coordinate advice on the science and technical aspects of the WFD.

England and Wales are often treated as a single unit as they share a legal system (English law) and a historical legacy. This case study therefore limits its focus to England and Wales.¹³ Throughout this chapter, the term “central planning” refers to the government in Wales (National Assembly for Wales) and the British Government for England, given that these represent the highest level of government in these nations.

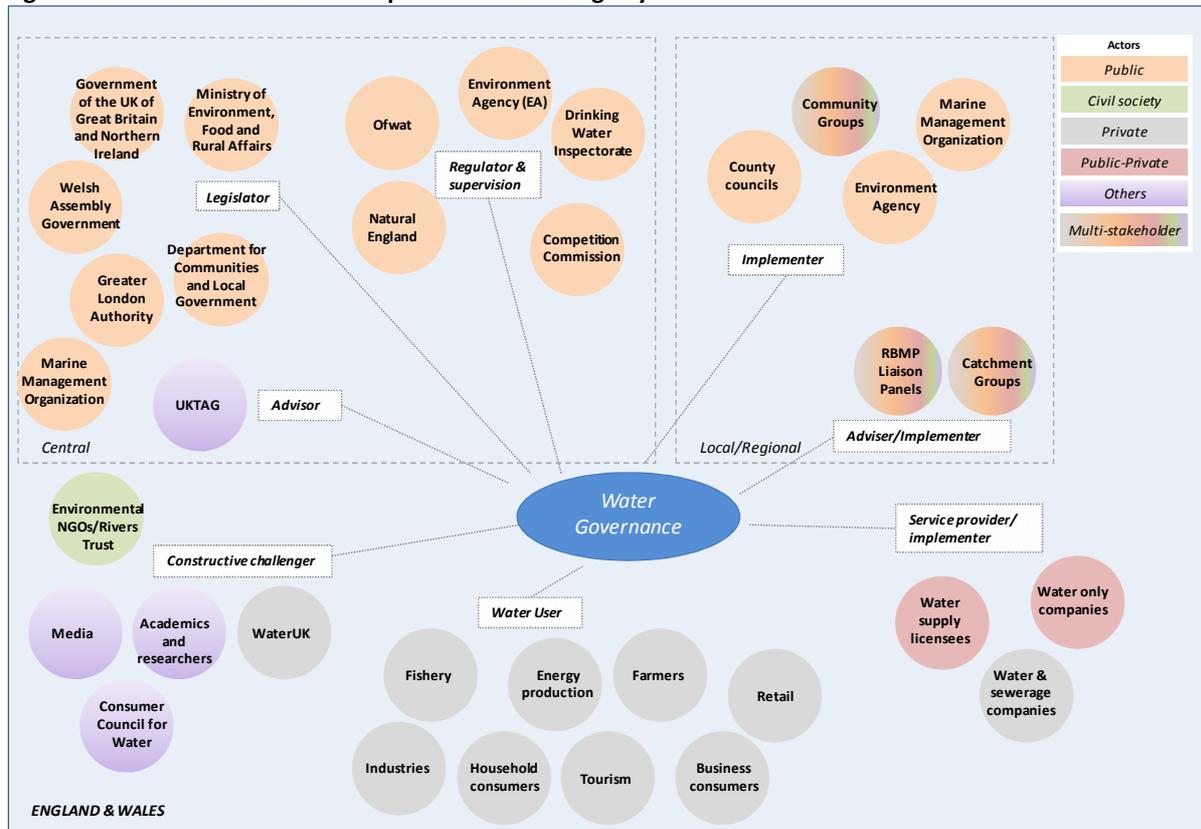
¹² See <http://www.wfduk.org/>

¹³ *England and Wales have a different governance approach to Sweden, given the greater private sector influence. This makes it an interesting case. Data and information are also more easily available for England and Wales, and given the time constraints researching several systems in parallel was not a feasible option.*

6.4 Roles and responsibilities of key actors and institutions

The key actors and institutions involved in governing water in England and Wales are shown in Figure 15. The actors and institutions are grouped according to their respective functions.

Figure 13: Division of roles and responsibilities among key actors and institutions



Source: Stockholm Environment Institute 2013

Defra¹⁴ - is the ministerial department responsible for policymaking on water supply and resources, and the regulatory systems for the water industry and the water environment. As part of Defra, **the Drinking Water Inspectorate**¹⁵ ensures that public water supplies are safe and drinking water quality is acceptable. **The Environment Agency**¹⁶ (EA) is an executive non-departmental public body and the environmental regulator. The EA plays a central role in delivering the environment-related priorities of the government and its regulatory duties span the land, rivers, the coast and the sea. **The Marine Management Organization (MMO)**¹⁷ is a newly established executive non-departmental public body for the sustainable development of the seas. It has been established as a cross-government delivery partner and its functions were previously the work of several different departments. **Natural England**¹⁸ is a non-departmental public body with responsibility for protecting and improving the natural environment of England and Wales.

Local authorities have little responsibility for water governance in England and Wales, and their role is mainly as long-term stakeholders. As local planning authorities, the **county councils** have more

¹⁴ See <http://www.defra.gov.uk/environment/quality/water/>

¹⁵ See <http://dwi.defra.gov.uk/index.htm>

¹⁶ See <http://www.environment-agency.gov.uk/>

¹⁷ See <http://www.marinemanagement.org.uk/about/index.htm>

¹⁸ See <http://www.naturalengland.org.uk/>

extensive responsibilities related to local flood management, and the recent National Planning Policy Framework for communities and local government emphasizes that planning and proactive strategies should consider flood risk, coastal change and water supply and demand. For example, local authorities should: consider water-related aspects in plans for mitigating and adapting to climate change, work with other authorities and providers to assess the quality and capacity of water-related infrastructure and, in their planning, reduce the risk of adverse impacts on water flows and quality (Department for Communities and Local Government 2012).

The private sector **Water Companies** are responsible for the water supply and for sewerage services. There are currently 10 regional companies that provide both water and sewerage services, 10 regional companies that provide water services only, five local companies that provide either water and/or sewerage services and eight **water supply licensees** that offer water services to large use customers (Ofwat 2013a). **Ofwat**¹⁹ is the economic regulator of the water and sewerage companies and formally a non-ministerial government department. In case of disputes between water companies and consumers, the **Consumer Council for Water**²⁰ can represent the consumer. It is a non-departmental public body and independent of Ofwat and the water companies. **WaterUK**²¹ represents the service suppliers at the national and EU levels, and thus functions as a channel for the industry to engage with government, regulators and other stakeholders. The **Competition Commission** ensures there is healthy competition among the UK companies and is the appeal body for disputes between Ofwat and the water companies.

Water customers, River Trusts, NGOs, productive sectors and the **public** mainly engage in water governance through **consultations, River Basin Liaison Panels, Catchment groups** or **community groups**. Such stakeholder forums are often chaired by the EA or water companies, and non-governmental groups often have more of an advisory role than a decision-making role.

- *Groundwater and Surface Water*

Most water in England and Wales is abstracted from surface water, but there are local variations. The South and East rely on groundwater to a greater extent than other regions (Environment Agency 2012).

The current system for water abstraction was set up in the 1960s and has not developed to include environmental considerations or to handle competing demands. This has led to non-sustainable abstraction from some rivers. Consideration for the environment has evolved over time, but this has not affected most abstractors, although the system is now under revision. The current system has been criticized for not being flexible enough. Licences issued before 2001 have no time limit. This has locked the system and limited freedom to adapt to changing circumstances. In addition, licences and discharge permits have been handled separately – hindering strategic catchment-wide allocation (Environment Agency and Ofwat 2012). An ongoing Water Abstraction Reform project will address unsustainable abstraction in River Basin Management Plans up to 2027 (Environment Agency and Ofwat 2012). River Basin Management Planning is used to link surface water management, land management, flood risk and diffuse pollution.

As the environmental regulator, the EA is responsible for setting the amount of water allowed for abstraction. According to the Habitats regulations it has a responsibility to act where abstractions

¹⁹ See <http://www.ofwat.gov.uk/>

²⁰ See <http://www.ccwater.org.uk/>

²¹ See <http://www.water.org.uk/home>

may be damaging. The Restoring Sustainable Abstraction Programme examines current abstractions to assess whether they are damaging sites of special scientific interest, and can enforce changes to licences. To assess licensing needs, Catchment Abstraction Management Strategies (CAMS) are used to evaluate freshwater availability and the needs of the environment at high and low flow. These are evaluated at the water body level (i.e. below catchment level) to assess local impact. The licensing system regulates everyone abstracting more than 20m³/day, and can impose conditions.

The main enforcement instrument to control abstraction is compliance with permits and the law. Water abstraction licensing is central to the sustainable use of water resources, and regulation perhaps becomes even more critical when water supply is privatized to companies seeking profits.

- *Water Supply and Sewerage*

Water supply and sewerage were privatized in 1989. In effect, this means that there is public-private governance of water supply and sewerage services, which are handled by private companies but heavily regulated by the government.

A regulatory framework has been in place since privatization to ensure that companies provide a high standard of service at a fair price. The regulatory framework involves: the EU, which sets water, wastewater and environmental standards; Defra/the Welsh Assembly, which set standards, drafts legislation and creates special permits such as drought orders; Ofwat, which protects consumer interests, promotes competition and ensures that companies carry out and can finance their functions; the EA, which regulates environmental aspects; the Drinking Water Inspectorate, which ensures that companies supply safe drinking water that meets set standards; the Consumer Council for Water, which represents consumers and investigates complaints; and the Competition Commission, which ensures there is healthy competition among UK companies (Ofwat 2013b).

The most common approach to supplying water is for companies to take water from groundwater or rivers and store it in reservoirs. There is a limited trade between companies and attempts are being made to increase this.²²

As is noted above, there are two types of company: smaller ones dealing with water only and larger ones dealing with both water and waste water. Many companies have a global ownership structure, mainly French, German, North American, Middle Eastern and South East Asian, and funds invested on the stock market, primarily in pension funds, infrastructure projects or similar.²³ Although the companies have changed and merged, the number has remained more or less the same since privatization. The boundaries within which the water companies operate are still based on hydrological boundaries (except for small town supplies where aquifer boreholes are used). This means that companies have a monopoly within their area and that customers cannot choose their supplier, although large business customers can. Ofwat therefore plays an important role in protecting the interests of consumers.

The main enforcement mechanism is compliance with the law and mandatory standards translated into UK law from EU Directives. Ofwat sets investment levels and the service package that customers receive, including a limit on the price that companies can charge customers (Ofwat 2013c). Prices are based on the companies' five-year business plans, which spell out their investment needs, delivery targets and level of service provision. The next price review is due in 2014. It will distinguish between

²² *Interview with Ofwat representative*

²³ *Interview with WaterUK representative*

wholesale (technical services) and retail (customer-related services) price controls for the first time. A 25-year water resources management plan provides a longer term perspective. This plan must be produced every five years, and should include forecasts of supply and demand, and of how companies will provide sufficient water to meet their customers' needs while protecting the environment. Companies allow customer and stakeholder participation in the drafting of these plans to a varying extent.²⁴ Business plans need the approval of a consumer group and according to a representative of WaterUK, customer engagement has improved in the current round of business plans. Independent consultations set up by the water companies have taken place and included the Consumer Council for Water, regulators, local authorities and civil society.²⁵

The main environmental regulatory tool is to set absolute standards for water abstraction or discharge based on the overall impact on the water body, taking upstream and downstream impacts into consideration. This means that the EA does not monitor the day-to-day state of the environment, but sets overarching standards. These standards are set in line with the WFD. Interviewees stated that EU Directives have imposed more onerous standards and are too prescriptive about how outcomes are to be achieved²⁶. The industry has tried to minimize standards in the WFD. A representative of WaterUK said that the standards are achievable but questioned whether they are providing the correct incentives. Much of the regulation and legislation is focused on single issues with hard requirements for absolute compliance. This is easier for the EA to administer but because companies are risk averse, they will ensure compliance by adding safety margins, which does not incentivize sustainability or the efficient use of public resources. Non-flexible regulation also affects how companies cooperate with other stakeholders and sectors. Although companies work with farmers, for instance, their interaction is often focused on single issues. For example, they may work together to reduce phosphorous, but companies would not be interested in including other issues unless they sit within the regulatory framework.²⁷

Industry representatives expressed a wish for more innovative ways of working that are adaptable to the state of the environment, arguing that demanding absolute compliance to non-flexible standards risks wasting resources and hindering innovation.²⁸

Another issue of relevance to sustainability pointed out by interviewees is the way the water industry is currently funded by returns on assets, which favours capital investment. Consequently, there has been large-scale investment in infrastructure – approximately GBP 100 billion has been invested in assets and service improvements since privatization.²⁹ Although outdated infrastructure was a problem at the time of privatization, it is now being questioned whether the focus on capital creates disincentives to pursue alternative solutions, such as soft catchment approaches or natural treatment, which could be more cost-effective.³⁰

Implementing the WFD implies costs for the industry, and it is a big challenge to balance the needs of the sector with customers' ability to pay.³¹ To support those that cannot pay for water social tariffs are now being considered. There are also a great variations in price in different regions, some of

²⁴ Interview with WaterUK representative

²⁵ Interview with WaterUK representative

²⁶ Interview with WaterUK representative and Wessex Water representative

²⁷ Interview with RM Wetlands and Environment representative

²⁸ Interview with Wessex Water representative

²⁹ Interview with Ofwat representative and WaterUK representative

³⁰ Interview with RM Wetlands and Environment representative

³¹ Interview with Ofwat representative

which are motivated by variations in geography, and some due to historical legacies. For example, the South West has the highest bills, in part because it has a small population and a long coast line, but also because the infrastructure was in worse shape than expected at the time of privatization.³² Efforts are now being made to adjust this.

Coordination between companies appears to happen mainly through WaterUK, where exchanges of best practice and collaboration on trials take place. Upstream/downstream issues across company boundaries are not a big problem as hydrological boundaries are respected.³³ Given the companies' monopoly status in their respective regions, they do not compete for customers. However, Ofwat bases its demands and expectations on comparisons of company performance, and companies are therefore less challenged by regulation if they improve their efficiency. There are therefore incentives to keep efficiency indicators secret.³⁴ Cross-sectoral collaboration is also quite limited, and the agenda limits activities to what is being regulated, creating silos.³⁵ A representative of WaterUK argued that water supply is a "unique sector" that does not have much to learn from other sectors, and learning is mostly from water industries in other countries. However, many companies support the new catchment approach and have been active in pilots and taken the lead on catchment groups and consultations. Companies are also an important participant in stakeholder consultations on RBMPs, although they claim that their role is not commensurate with the responsibilities that will fall to them.

- *Marine Management*

As part of an island, the marine area is an important part of the natural environment of England and Wales. Natural England views the seas as a provider of goods and services: climate regulation, food sources, carbon storage, energy (oil, gas, wind farms), building materials, transport and recreation. Yet, the seas have historically not been protected to the same extent as terrestrial areas (Natural England 2013a).

The Marine Strategy Regulations give effect to the EU Marine Strategy Framework Directive in UK law. The EA and MMO implement the Directive, especially with regard to Good Environmental Status indicators (HM Government, 2013). However, England and Wales have approached the overlaps between the Marine Strategy Framework and Water Framework Directive by focusing on implementing the WFD and only applying the Marine Framework Directive to aspects that are not covered in the WFD, such as noise, litter and some elements of biodiversity.³⁶ It is the government's understanding that the WFD and its related directives are sufficient for ensuring "Good Environmental Status" in waters where there is a need to comply with both directives (HM Government 2012a). The government claims that the targets and indicators in the Marine Framework Directive are aligned with the tools of the WFD, and it is working to align the monitoring programmes for the two directives (HM Government 2012a). The need for additional activities and management measures to comply with the aspects not covered by the WFD is being investigated. The Birds Directive and the Habitat Directive link with the Marine Framework Directive targets for

³² *Interview with Ofwat representative*

³³ *Interview with RM Wetlands and Environment representative*

³⁴ *Interview with Ofwat representative*

³⁵ *Interview with RM Wetlands and Environment representative*

³⁶ *The scope of Good Environmental Status under the Marine Framework is broader and covers aspects for coastal water bodies that are not included in the WFD Assessment. The scales is also different – sub-regions for the marine directive and individual coastal water bodies for the WFD. The Marine directive is also seen as taking a more holistic approach to protecting the marine environment.*

biodiversity, food webs and sea-floor integrity, and are important for establishing the UK marine protected area network for coherent spatial marine protection, and to the Common Fisheries Policy which the government is now trying to reform (HM Government 2012b). It is the government's understanding that there is comparability between the targets in the Marine Framework Directive and the targets in the Habitats Directive with regard to listed species and habitats, but that there may be gaps in wider marine habitats which the Habitats Directive does not cover (HM Government 2013).

The Marine and Coastal Access Act 2009 established a new system of marine planning with a focus on sustainable development. It has gathered key marine decision-making bodies and delivery mechanisms under the lead of the MMO. This new organization incorporates various functions of the Marine and Fisheries Agency, the Department of Energy and Climate Change and the Department for Transport, and several of its responsibilities encourage cross-sectoral/agency coordination.³⁷ The Marine and Coastal Access Act established a single marine development authority, allowing ministers to delegate their functions to the MMO.

Marine planning in England and Wales applies an ecosystem-based approach to managing human activities. The MMO states that engaging with local planning authorities with a stake in the marine environment is an important part of the marine planning process, and the National Planning Policy Framework gives it a duty to cooperate.

The Marine Policy Statement sets the framework for marine planning and developing, implementing and monitoring national and sub-national Marine Plans – including marine policies and EU and international commitments and recommendations. The 2011 MPS emphasizes that the marine planning process will take a strategic and holistic approach, achieve integration between objectives, acknowledge competing demands, take an ecosystem-based approach and link with terrestrial planning (policies considered in the Marine Policy Statement overlap with the terrestrial planning system) (HM Government et. al. 2011). Under the Marine and Coastal Access Act, all authorities must take decisions which affect UK marine areas in accordance with the Marine Policy Statement (as translated in an adopted Marine Plan). Marine Plans will lead the process of linking marine and land planning.

Two Marine Spatial Planning pilots have been conducted in Dorset and the Solent in the south of England.³⁸ Established groups were used to facilitate dialogue in a neutral platform. The results of the pilots indicated that this helped to ease stakeholder tensions at an early stage and improved the evidence base, but involvement was restricted due to uncertainties over the new concept and a lack of resources. One of the benefits identified was that the participants increased their understanding of the complexities of marine planning, and of the views of other stakeholders.

³⁷ Stated responsibilities include: implementing a new marine planning system designed to integrate the social requirements, economic potential and environmental imperatives of our seas; implementing a new marine licensing regime that is easier for everyone to use with clearer, simpler and quicker licensing decisions; managing the UK's fishing fleet capacity and fisheries quotas; working with Natural England and the Joint Nature Conservation Committee (JNCC) to manage a network of marine protected areas designed to preserve vulnerable habitats and species in UK marine waters; responding to marine emergencies alongside other agencies; and developing an internationally recognized centre of excellence for marine information that supports the MMO's decision-making process (Marine Management Organization 2013).

³⁸ The two pilots are: C-SCOPE (Combining Sea and Coastal Planning in Europe) a project undertaken by the Dorset Coast Forum and SoMaP (Solent Marine Planning) a project undertaken by the Solent Forum.

- *Flood and Coastal Management*

“Hard defences” such as walls have been the traditional way of mitigating risks, but Integrated Coastal Zone Management (ICZM) is now used, following the approach set out in EU directives (Parliamentary Office of Science and Technology 2009). According to Defra, this approach allows coastal interests to have a greater say than previously in marine planning and management, as it involves a partnership of stakeholders to produce joint plans on coast-related topics (Defra 2002).

The UK lacks a common definition of a “coastal zone or area” and a common vision is difficult due to the great variation in geography along the coast. Many local areas have their own visions (Defra 2008). The “Strategy for promoting an integrated approach to the management of coastal areas in England” aims “to integrate coastal policies and provide a clear, strategic direction to coastal managers” (Defra 2008). A cross-departmental working group³⁹ was established to coordinate efforts to develop policies, address the challenges that coastal towns face and improve cross-government understanding of needs. It seeks both vertical (national to sub-national) and horizontal (across social, environmental and economic issues) integration. A Regional Development Agency Coastal Towns Network brings together stakeholders to improve coordination and share best practice. It includes sub-groups for exploring and providing input on cross-cutting policy themes.

The Marine Policy Statement aims to integrate the coast into the marine environment. A stakeholder analysis of the Solent pilot however showed that 40% of respondents had no interest in off-shore areas (Maguire, Potts and Fletcher 2012). Moreover, operating authorities have a remit that is largely restricted to the coastal area of the marine environment, and the offshore area is often beyond the jurisdiction of regulatory authorities. In addition, coastal communities tend to have a strong connection to the coast that seldom extends far out to sea – except for communities largely dependent on offshore resources (Maguire, Potts and Fletcher 2012).

Policy responsibility for flood and coastal erosion risk management sits with Defra, while the EA, Lead Local Flood Authorities (local authorities) and regional coastal groups made up of local authorities and the EA are the main implementers. The 2009 Flood Risk Regulations implement the requirements of the EU Floods Directive, under which reporting is at the River Basin District level. These districts are the same as those under the WFD (and the RBMP), and the two directives are coordinated as set out in the “Working together consultation document”. The EA has responsibility under the 2009 Flood Risk Regulations and the Flood and Water Management Act 2010 for flood risks from main rivers, the sea and reservoirs, while the Lead Local Flood Authorities have responsibility for local level risks such as from surface run-off, groundwater and ordinary watercourses (Environment Agency 2013). Lead Local Flood Authorities produce local Flood Risk Management Strategies that feed into the National Flood and Coastal Erosion Risk Management Strategies. The EA is now investigating how best to develop and coordinate the Flood Risk Management Plans of the Lead Local Flood Authorities, which will be published in 2015.

6.5 Stakeholder involvement across sectors and levels

Implementation in England and Wales is characterized by strong central planning. The involvement of stakeholders in decision-making across levels is low, and local authorities, panels and community

³⁹ Including Department for Business, Enterprise and Regulatory Reform, Defra, Department for Culture Media and Sport, Department for Transport, Department for Work and Pensions, Communities and Local Government, Department of Energy and Climate Change, Regional Development Agencies and Environment Agency.

groups generally participate in consultations as stakeholders without decision-making powers. The EA, as the main implementer, has a strong role and a tradition of not involving other stakeholders. There does appear, however, to be a shift – at least theoretically – to a more participative and integrated way of managing water in preparation for the second phase of planning under the WFD, such as the new catchment approach and a new approach to marine planning. Although implementation will now move to lower levels and there will be more collaboration with stakeholders, it is not clear how this will shift power. For example, Watson et al. (2009) argue that while using the language of collaborative governance arrangements, the water bureaucracy has actually strengthened its control over time and collaborators have little real influence over water policy. The River Basin Liaison Panels, for example, included stakeholders representing the productive sectors (e.g. farmers, fishermen), the Consumer Council for Water, Natural England, water companies and local authorities, but never became truly collaborative. The panels were presented with or briefed on the processes or the decisions that had already been made by the EA, rather than offered an opportunity to influence them (Watson et al. 2009).

The institutional set-up and the mandates of central institutions appear to allow for an integrated approach across sectors. Defra, the EA and Natural England all have cross-sectoral mandates. The recently established MMO also seems to reflect a shift as it integrates the functions of several sectors, e.g. energy and climate, and transport, with the objective of increasing coordination and integration. The cross-sectoral mandates could arguably support horizontal integration in planning and implementation. The tradition of River Basin Planning, which predates the WFD, would also imply this. Interviewees, however, describe the management of water as compartmentalized in practice.⁴⁰ The WFD remains the focus of the implementation of EU directives, and coastal and marine management are disconnected from inland management. Few interviewees with experience of inland water resources management expressed any interest in or knowledge of marine management, and coastal management is said to have been lost in current discussions.⁴¹ One interviewee claimed that there is less joint thinking now than 20 years ago, due to the separate focus of EU directives (e.g. on nitrates, water and habitats) which discourages cross-sectoral work.⁴² There are also inconsistencies and gaps in coherence between directives and legislation, according to one interviewee, in particular because other legislative areas do not reference back to the WFD.⁴³ A representative of the EA explained that it is generally not given new powers or policy instruments to implement new directives and is therefore limited to using existing mechanisms, e.g. by changing standards in the existing permissive framework. Furthermore, there is a perceived fear by government of not abiding by EU standards, which limits the will to test new approaches.

The importance of coordination between directives, policies, stakeholders and sectors is acknowledged by policymakers and prompts closer links between government departments in the translation of policy to implementation, but the mechanisms for putting this into practice remain unclear.⁴⁴ Coordination of the implementation of various directives seems to rely on ministers and

⁴⁰ Interview with RM Wetlands and Environment representative

⁴¹ Interview with representative of academia

⁴² Interview with RM Wetlands and Environment representative

⁴³ Interview with WaterUK representative

⁴⁴ Interview with representative of academia

policymakers “talking to each other”, but without formal mechanisms.⁴⁵ It therefore remains at the central level.⁴⁶

6.6 Overview of key policies and strategies

The **EU Water Framework Directive** and its offspring directives form the overarching framework for water governance in England and Wales. The EA is responsible for implementing the WFD and works to ensure that any partnership working in coastal or marine areas is compliant with the WFD. Water companies are guided by the quality and quantity standards set by the EA. The EA is responsible for producing **River Basin Management Plans** and submitting them to the Government for approval. River Basin District Liaison Panels involve stakeholders at the river basin level in the development of these plans. The panels comprise about 20 people from the sectors responsible for making the changes implied by the WFD. The public can attend as observers by arrangement with the Chair. The EA is also responsible for combining the measures and delivery mechanisms needed for implementing the WFD in a programme for each river basin. The scope of this **programme of measures** extends to WFD objectives only and it is submitted to the Secretary of State. In deciding what measures to include the EA must work with other regulators and implementers. A summary of the programme of measures is included in the draft RBMPs, which are put out for consultation. These should reflect several scenarios. The **Water Environment Regulations 2003** translate the WFD into national law.

Defra has formulated its vision for future water management in a **Water White Paper**. All stakeholders should work towards fulfilling this vision, which proposes a reformed water abstraction regime to deal with over-abstraction, reaffirms the new catchment approach, removes barriers to trading abstraction licences to make the system of supply more flexible, provides clearer guidance to water companies on long-term planning, looks to introduce national standards and a planning system for sustainable drainage, adjusts unfair bills, introduces social tariffs, extends competition in the water sector and discusses awareness-raising on water saving. The suggested reforms reflect the challenges that the water sector currently faces, many related to how the water industry is regulated.

The **Draft Water Bill** takes forward the proposed legislative changes in the Water White Paper with regard to reforming the market and modernizing Ofwat’s regulatory powers in the interests of consumers. It also suggests that the Drought Plans which companies are obliged to develop under the Water Industry Act should be aligned with other water planning cycles.

The Catchment Based Approach was launched in 2011 as a way of introducing integrated catchment management across England by 2013. It suggests a shift in the planning unit to the sub-river basin level. The approach aims to be a coordinated and sustainable way to balance environmental, economic and social demands by working with stakeholders at the catchment level to support the second cycle of RBMPs under the WFD. It integrates land management and water issues and sets out to develop catchment plans that will work as roadmaps for implementing activities to drive change. The EA is leading implementation and the pilot phase is currently being evaluated.

Reform of the Water Abstraction Regime and the **Restoring Sustainable Abstraction (RSA) programme** are two other results of the Water White Paper linked to the WFD. The reform of the

⁴⁵ Interview with representative of academia

⁴⁶ Interview with representative of academia

abstraction regime aims to modernize the licensing system. The EA and Ofwat are the main implementers. The RSA programme aims to review the balance between abstraction from rivers, reservoirs and groundwater sources, and the needs of the environment. It is linked to the WFD, the Habitats Directive and Sites of Special Scientific Interests (SSSI). The EA is responsible for its implementation. The EA uses **Catchment Abstraction Management Strategies (CAMS)** to assess sustainable levels of abstraction.

Private companies are the main abstractors and they are primarily guided by the **Water Act 2003**, the **Water Industry Act 1991** and the **Water Resources Act 1991**. These Acts set the framework for abstraction, licensing, competition, impoundment and drought management, e.g. by requiring companies to draft proactive drought plans. The **EU Drinking Water Directive** is also important as it guides national standards. The strategy for economic regulation of the water industry is set out in Ofwat's strategy "**Delivering Sustainable Water**".

The **EU Marine Strategy Framework Directive** is transposed into the **Marine Strategy Regulations 2010** and set out in the marine strategy – "**Making Space for Water**". The Framework Directive is implemented mainly through the WFD and seen as part of a package of policies combined in the UK vision of "clean, healthy, safe, productive and biologically diverse oceans and seas". The **EU Bathing Water Directive**, the **EU Freshwater Fish Directive** and the **EU Shellfish Waters Directive** are part of this. The MMO was established under the **Marine and Coastal Access Act 2009**, which initiated the measures for marine planning now taken forward in the **Marine Policy Statement**. Responsibility for implementing marine policy sits with the MMO and the EA.

The **EU Floods Directive** was transposed into law in the **Flood Risk Regulations 2009**. Local Flood Authorities and the EA are responsible for implementing the **Flood and Water Management Act**. The **Marine and Coastal Access Act 2009** and the **Strategy for Promoting an Integrated Approach to the Management of Coastal Areas in England** are the guiding documents for coastal areas.

The **Waste Water National Policy Statement** sets out the framework for planning decisions on nationally significant wastewater infrastructure.

The WFD and the **OSPAR Convention** both take an **ecosystems approach** and provide political momentum for a focus on ecosystem services. Defra states that an ecosystem approach is the underlying foundation for the delivery of environmental policies. Defra leads on the development of the government's ecosystem approach and has presented an ambitious **Ecosystem Approach Action Plan** (Defra 2010). The overall aims are to shift the focus of policymaking and implementation away from working in silos and to ensure that ecosystem services are reflected in policies and decision-making within Defra and at all government levels. In practice, the UK has made a first step towards an ecosystems approach and CBD principles in its framework for marine management (Laffoley m.fl. 2004).

6.7 Experience of policy implementation

- *The overall approach to policy implementation*

According to Vedung et al. (1998), the definition of regulation in standard English is the "issuance of rules, orders, directives, norms, standards and statutory provisions of an obligatory nature, backed by negative sanctions or threats of negative sanctions by government" (Bemelmans-Videc, Rist and Vedung 2011). In England and Wales such non-voluntary mechanisms seem to be the main tool for

policy implementation. There are more “sticks” than “carrots”, and a limited focus on collaboration. There is information sharing through stakeholder groups (e.g. liaison panels, catchment groups and coastal partnerships), but decision-making at all levels of implementation is centrally driven by the environmental regulator and policymakers. In the RBMP liaison panels, the role of the stakeholder is often to comment on suggestions or decisions already made, and the level of true collaboration is often questionable. Consultations, where drafts of official documents are publicly available and open for comments, seem to be the most common form of stakeholder involvement. There is a separate body (the Consumer Council for Water) to represent customers vis-à-vis water companies, but the companies also engage with their customers through consultations and consumer panels. To some extent, economic incentives are used as carrots, as the water sector is privatized and water companies have an interest in reducing water treatment costs, among other things. On the other hand, there are no true market structures as companies operate in isolation from each other and do not compete for customers. Instead, prices and competition are regulated by the state and efficiency ensured by absolute compliance with permits, licences and standards. Compliance is monitored by the regulator, and companies are either publicly named or fined.

The overarching view is that the current system allows for little flexibility. One interviewee even said that the main challenge of current water governance arrangements in England and Wales is “to change anything”.⁴⁷ A representative of a water company however provided an example of softer regulation taking place, showing there may be room for increased flexibility. The water company was experiencing problems with water quality due to the presence of nitrates and pesticides, and when the regulator approached it, the company agreed to start working on catchment plans in a collaborative approach rather than water treatment plans as an end-of-pipe solution. Using this approach helped the company improve raw water quality and reduce treatment through increased collaboration at the catchment level, at a cheaper cost.⁴⁸ This example demonstrates increasing collaboration between operators and regulators. Other examples of a shift in implementing practice are the “New catchment approach” and the “Catchment Sensitive Farming Programme” (also referred to as the “Catchment Sensitive Farming Programme” and the “Welsh Catchment Initiative”).

- *Implementing the Water Framework Directive*

Although the WFD is the overarching guiding document for water policy, the government has until now focused more on getting its own “house in order” than on delivery. Rather than using the WFD to drive new initiatives, government institutions have mainly looked at how to squeeze what they already do into the WFD.⁴⁹ The focus has therefore been on meeting EU demands rather than cross-sectoral solutions. There appears to be a dual approach, where local civil society pushes the government, on the one hand, and the government and regulators spot and absorb initiatives, on the other.⁵⁰ The government has not taken a proactive approach, but provided support to ongoing initiatives. Nonetheless, the top heavy administrative process with great emphasis on the regulation of new initiatives has not worsened under the WFD.

According to one academic, the first phase of implementing the WFD was “a disaster” in England and Wales.⁵¹ The River Basin District (RBD) was adopted as the primary level of analysis (Environment

⁴⁷ *Interview with Environment Agency representative*

⁴⁸ *Interview with WessexWater representative*

⁴⁹ *Interview with RM Wetlands and Environment representative*

⁵⁰ *Interview with RM Wetlands and Environment representative*

⁵¹ *Interview with representative of academia*

Agency 2006). Decision-making at the RBD-level was driven by the EA but Liaison Panels were established in each district, primarily to advise on the development of the River Basin Management Plan. According to Defra's River Basin Planning Guidance document, the role of the Liaison Panels is advisory, to facilitate discussion and negotiation between deliverers and regulators. Their impact on measures and mechanisms to be included in the RBMP should be "vital", but the EA is legally responsible and makes the final decisions. The Liaison Panel members were defined as "co-deliverers" but according to Watson et al. (2009), the development of plans never became truly collaborative. Interviewees representing academia describe the first phase as a highly technical process that did not facilitate social processes.⁵² While Liaison Panels were established for each catchment district (and at the national level), their level of representation was limited. For example, there was one seat to represent the entire NGO lobby. The panels were often chaired by the EA, as one of few stakeholders with the resources available to host. A top-down approach was further reflected in the way the EA approached the characterization of river basins (an obligation under the WFD). This was carried out at the national level based on the EA's own internal data on large River Basin Districts, which did not allow for detailed maps. These were to serve as the basis for future planning (Watson et. al 2009).

- *A different approach for the second phase of the WFD*

The approach to the first round of the WFD was hierarchical and top-down, which created tensions that trickled down to the catchment level. Moreover, the river basin as a unit was perceived as irrelevant by most stakeholders, as the challenges faced by stakeholders in one part of the basin were not the same as those faced by stakeholders in other parts.⁵³ The failures of the approach adopted in the first phase were later acknowledged by the EA, which is now testing a new approach in preparation for the second phase. The New Catchment Based Approach will be rolled-out across England and Wales as a new way to manage water (Defra 2013a)

The stated vision is to work with stakeholders to establish a framework for integrated catchment management, building on integration of the three pillars of sustainability, be bottom-up and collaborative (Defra 2013b). Defra and the EA are trying to be truly collaborative.⁵⁴

Catchment groups will formulate a mutually agreed Catchment Plan, which will set out the activities required to meet the challenges in the catchment based on local knowledge as drivers for change. These plans will not be legal documents. They will, according to an EA representative, include actions that help to deliver the objectives of the WFD, which will be captured in the catchment planning system and feed into the RBMPs.⁵⁵ Interestingly, there is not yet an agreed understanding of how vertical integration will work, i.e. how catchment plans will be connected to the RBMPs – the unit for analysis to be reported under the WFD.⁵⁶

In a pilot phase, 10 EA-led and 15 externally led pilots were carried out in 2012. The 10 EA-led pilots have recently submitted their catchment plans.⁵⁷ To facilitate the pilots, which were voluntary, Defra provided resources for a professional facilitator and an evaluation team. The EA is currently working on an evaluation report and Defra will provide a framework for the wider adoption of the catchment-

⁵² Interview with representative of academia

⁵³ Interview with representative of academia

⁵⁴ Interview with representative of academia

⁵⁵ Correspondence with Environment Agency representative

⁵⁶ Interview with representative of academia

⁵⁷ Correspondence with Environment Agency representative

based approach in April 2013. Defra and a consulting firm are also undertaking evaluations of the pilots and working on a handbook for catchment planning and delivery, which will include lessons learned.⁵⁸

Based on its interim findings, the EA suggests that the approach has had several benefits related to increased transparency, improved skills around engagement, sharing of evidence, greater opportunities for stakeholder influence and community involvement.⁵⁹ The 12-month pilots however proved too short to understand and build relationships. In catchments where no networks were in place prior to the pilots, progress was therefore limited.⁶⁰ On the other hand, the pilots were successful in terms of setting up a unit that is relevant to stakeholders (e.g. farmers, fishermen, the water industry, the EA) and discussions have been meaningful. In the sense that the catchment connects to the reality on the ground, it also appear to facilitate an integrated approach.⁶¹ A critical challenge in England and Wales, however, is to agree the legal status of the catchment plans in relation to river basin plans, and ensure coherence horizontally between catchment groups and plans in other sectors, and vertically between catchment plans and river basin plans. Water companies have been involved to varying degrees as stakeholders or initiators in the different catchments. WaterUK believes the catchment approach has the potential to be proactive and facilitate cross-sectoral integration, and most companies are positive about the approach. As their interests mainly lie in the potential to improve water quality, which would reduce treatment costs, their support of the approach will be dependent on the results that the Drinking Water Inspectorate presents.⁶²

Another initiative, the Catchment Sensitive Farming Programme, is a voluntary, joint project between the EA and Natural England funded by Defra and the Rural Development Programme for England. It focuses on information as a tool for change, which demonstrates there may be new policy implementation practices following the WFD. By focusing on 40 priority catchments, the project has successfully reduced diffuse water pollution from agriculture and helped meet the standards in the WFD, reducing the risk of regulation being applied to farming (Natural England 2013b, Collins et. al 2007). As part of the programme, free training, information and practical advice are provided to farmers and a Capital Grant Scheme is available on a competitive basis for catchment-level priorities, such as watercourse fencing and roofing for pesticide loading. The initiative is an example of an ecosystem approach and a catchment perspective being adopted in practice.

6.8 Key innovations for cross-sectoral integration and collaboration

This review of how water is governed in England and Wales reveals several innovations for facilitating cross-sectoral integration and collaboration. On a general level, there is the ecosystem approach that underlies Defra's decision-making, which arguably provides political space for adopting integrated approaches. For example, Defra considers focusing environmental decision-making at the catchment level, which is now being tested, to be very much in line with an ecosystem approach (Potschin and Fish 2009). Another example is the cross-sectoral scope and mandates of Defra, the EA and Natural England. Although this seems to facilitate cross-sectoral collaboration, it also appears quite ad hoc, emphasizing the need for established mechanisms.

⁵⁸ *Correspondence with Environment Agency representative; See also <http://www.catchmentchange.net/pilot-catchments/evaluation-of-pilot-catchments/>*

⁵⁹ *Correspondence with Environment Agency representative*

⁶⁰ *Interview with representative of academia*

⁶¹ *Interview with representative of academia*

⁶² *Interview with WaterUK representative*

The marine area appears to be leading the way in cross-sectoral integration and collaboration in England and Wales, with the introduction of marine planning. This is reflected both in the institutional set-up of the MMO and the policies identified for implementation. Marine planning is a novel approach to governance in England and Wales that is more participatory and bottom-up than earlier approaches. However, the pilots carried out have relied to a great extent on existing partnerships, and it is not clear how the elements of the pilots will be scaled up. There are also examples of innovation in the coastal management area, such as cross-departmental working groups and coastal town networks that take an integrated coastal zone management approach.

Two concrete innovations are the new Catchment Based Approach and the Catchment Sensitive Farming Programme, where action is taken to engage stakeholders at the sub-river basin level. The Catchment Sensitive Farming Programme is perhaps the best example as it also introduces a softer form of policy implementation through its focus on information sharing.

The decision to privatize was certainly an important innovation in water governance, but there have been few unique initiatives with regard to cross-sectoral integration and collaboration. Companies mainly engage with consumers through traditional forums, such as consultations.

7 Finland

7.1 Historical trends for water governance

Two general trends have had a big impact on Finnish water governance. Globalization has changed the structure of the Finnish economy, reducing the importance of some sectors while increasing the importance of others. For example, the paper and pulp industry has reduced its production capacity in Finland since 2005 and this change is continuing, resulting in the closure of several factories in Finland. On the other hand, the mining industry is growing and investing in Finland, especially in the northern parts of the country.

The other important trend that has affected Finnish water governance is the general reduction in public resources. A public sector productivity programme in place since 2003 has meant a reduction in administrative personnel in ministries and regional organizations – about 5600 man-years were cut from state organizations between 2005 and 2010 (National Audit Office 2011), mostly through natural wastage.

7.2 Water resources for people and nature

Finland has rich water resources and an abundance of lakes and rivers (Table 3). Lakes cover 9.9 % of the total area of Finland, in some regions more than 25 %. In some municipalities, lakes cover about 50 % of the total area (Mäkinen 2005). Finnish lakes are shallow, and thus susceptible to pollution. Rivers form an important part of the landscape of northern Finland as well as on the west and south coast.

Table 3: Country specific information

Total population ^A	5 401 267
Population density (per square kilometers) ^B	17.6
Urban population, percentage ^C	85.1
Surface area square kilometers ^C	338 424
Length of coast , kilometers ^D	46 000
Area of coastal and transitional water bodies, square kilometers ^E	32 573
Number of river water bodies ^F	1 602
Total length of river water bodies, kilometers ^F	28 875
Number of lake water bodies ^F	4 275
Total area of lake water bodies, square kilometers ^F	28 172
Total area all surface water (rivers, lakes, transitional and coastal waters), square kilometers ^G	60 742
Number of river basins ^H	8
Number of shared river basins ^H	4
Annual renewable fresh water resources (precipitation and external inflow less actual evapotranspiration), millions of cubic meters ^I	110 000
Total gross freshwater abstraction, millions of cubic meters ^J	2 319
Freshwater abstraction per capita, cubic meters (Total gross freshwater abstraction divided by total population)	429

Sources: ^AEurostat, (2012), ^BEurostat, (2010), ^CUN data, (2013), ^DFinnish Environment Institute (2011), ^ETattari and Väisänen (2011), ^FEEA, (2009a), ^GEEA, (2009b), ^HEC, (2012c), ^IEurostat, (2013), ^JUnited Nations Statistics Division, (2010b).

Problems with water quality occur especially in the coastal areas of western and south-western Finland due to eutrophication as well as acidification and the leaching of heavy metals from acidic sulphate soils. The ecological quality of rivers has also been reduced by the construction of riverbeds and hydropower plants. Problems with water quantity occur mostly on the west coast, as spring flooding when the snow is melting. Climate change will increase winter flooding and summer droughts (Veijalainen et al. 2012).

There are over 6000 groundwater areas in Finland and the estimated rate of groundwater formation is about 5.4 million m³/day. Groundwater quality is mainly good. It is an important source of drinking water in Finland (GoF 2012b).

- *Industry and transport*

Most of the water abstracted is for energy production and manufacturing industry. In energy production, water is used for cooling and hydropower production. Manufacturing industry, in many cases the paper and pulp industry has been an important source of pollution in inland waters. Long-term work on water protection means that water quality in many previously problematic areas has improved, and the focus has shifted to addressing diffuse pollution. However, recent events have shown that industrial water pollution can still be an issue if care is not taken to control it efficiently. Discharge limits set by environmental permits have been exceeded in the mining industry. In the most serious case, at the Talvivaara mine, a new processing technology is being used and there is no previous experience of water protection with this kind of a process. There are not enough capacity or resources in the Centres for Economic Development, Transport and the Environment (ELY centres) for supervision.

One of the most important adverse environmental effects of hydropower production is that dams block the migratory routes of endangered native fish populations. In Finland the construction of new hydropower plants is limited by the **Act on the Protection of Rapids** (35/1987) and separate acts concerning Ounasjoki and Kyrönjoki. The adverse effects on the fish population have largely been mitigated using fish breeding and fish stocking. The Finnish fish pass strategy aims to move resources away from artificially supporting fish populations to trying to protect their natural cycles (MoAF 2012). Strategy implementation is connected to the implementation of the River Basin Management Plans. Cooperation is organized through regional cooperation groups (see below). The fish pass strategy guides civil servants within state organizations in their decisions concerning water permits and the requirement to mitigate fish losses. This requirement will often include constructing fish passes.

Water transport is important for both cargo and passenger transportation. Traditionally, there has also been timber floating in Finnish inland waters. This is still going on at some locations, but it has largely been replaced by cargo boats. The prevention of oil spills is an important issue in water transport. Finland has been able to reduce oil accidents by efficient supervision and charging administrative fees to companies that cause oil spills, which is faster than a court process. The fee has been in use since 2006 and it has had an efficient preventive effect: the number of oil spills has been halved in six years and the spills are also smaller than before (Finnish Environment Institute).

Fish farming needs clean water for fish production, but it also pollutes the water by adding nutrients. Nutrient recycling is an important issue connected to fish farming. At the moment, the feed used in fish farming is made of imported fish, but the state's plans to increase nutrient recycling would mean increasing the use of Finnish fish coming from fish stock management.

- *Drinking and household water*

The supply networks of water plants cover about 90 % of Finnish households and the sewage networks about 80 %. Municipalities must develop the water supply and sewerage in such a way that there is a sufficient supply of good quality household water, and that drainage and sewage treatment is organized in an appropriate way taking into account public health and the environment.

- *Recreation and tourism*

In Finland, recreational use of water bodies is culturally very important. Summer cottages near water, swimming, boating and fishing are the most important recreational uses. Recreational uses require good quality water.

Land use planning is an important tool for ensuring natural values, water protection and landscape values are taken into account when building near lakes or the seashore. Master plans and regional plans guide the building of summer cottages and permanent housing. Municipalities are interested in new lake or seashore developments of permanent housing since they attract new taxpayers.

An important issue related to fishing regulations is protection of the Saimaa seal, a species endemic to the Saimaa lake area of Finland. Seals are regularly drowned by fishing nets and fish traps. Fishing restrictions are in place, but they are not sufficient. The Finnish Nature Protection Union is promoting the protection of this species and is, e.g., collecting money to be able to purchase land to become a water area cooperative. There are 20 000 collectively owned water areas in Finland. Cooperatives consisting of the owners of the water rights manage these areas. Water rights include fishing rights. The cooperative is required to organize fishing in a sustainable way. It sells fishing permits to other persons living nearby and supervises fishing in its area.

- *Ecosystem services*

In the interviews conducted for this study the term ecosystem services was not mentioned in connection with water governance. It seems that the term is in the theoretical phase of definition and is mostly used in connection with economic valuation.

7.3 Institutional overview and key actors

- *Administration*

For historical reasons, Finnish water administration is divided into water resources (*quantity*), under the Ministry of Agriculture and Forestry, and *quality*, under Ministry of the Environment (Mäkinen 2005). Water transport comes under the Ministry of Transport and Communications, and drinking and bathing water quality under the Ministry of Social Affairs and Health. The Finnish Environment institute carries out expert tasks related to both water resources and water protection and these tasks are well integrated within the institute.

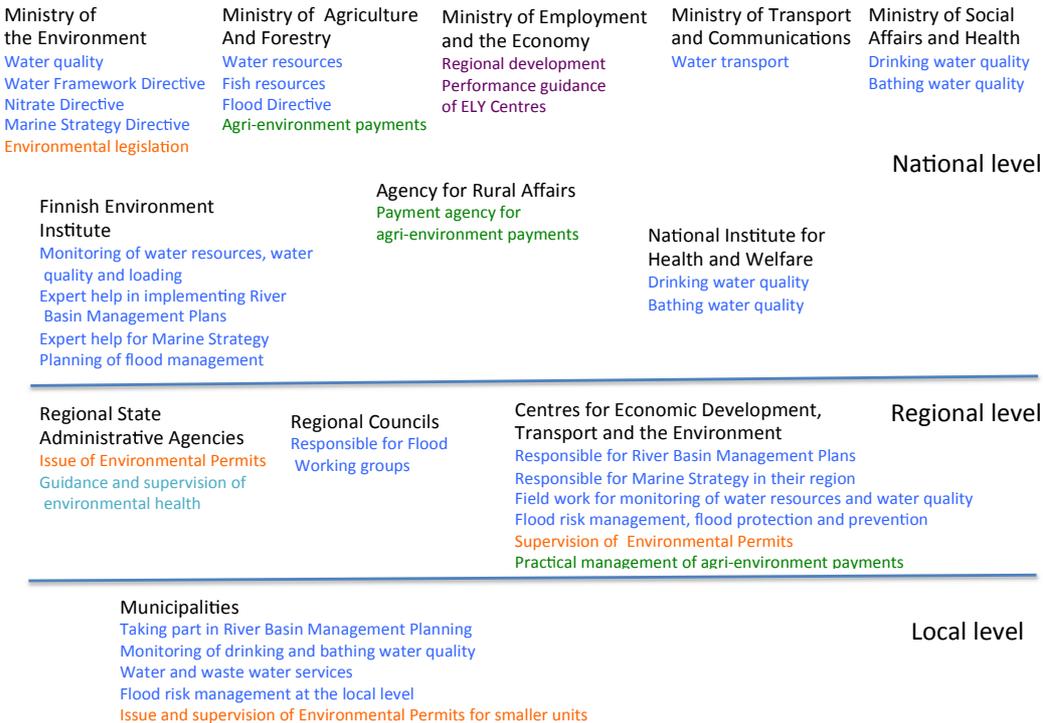
Finnish administration is relatively decentralized, and many tasks are delegated to either regional or local authorities (Berninger et al. 2011). At the regional level, ELY Centres carry out several water management tasks (Figure 16). They lead the work on RBMPs, supervise the environmental permits issued by Regional State Administrative Agencies, and carry out monitoring fieldwork. They also have responsibilities related to flood risk management planning and Marine Strategy preparation. Regional Councils are responsible for regional land use planning, and lead the flood working groups.

At the local level, the municipalities are responsible for water supply and waste water treatment either through their own water departments or companies, or in cooperation with other

municipalities. Municipalities monitor the quality of drinking and bathing water and report it to the National Institute for Health and Welfare. They issue and supervise environmental permits for activities with lesser environmental effect, and take part in river basin management planning and flood working groups. Municipal environmental authorities are generally environmental committees – political bodies with elected members. Civil servants prepare and present reports for the committees, which make independent decisions. Environmental committees have a lot of power in Finland, for example, over issuing environmental permits.

Cooperation on water issues between different ministries works well. Each ministry participates in the preparation of legislation, plans or programmes concerning their area of responsibility. Cooperation between the regional level and the municipalities is effective, for example, on environmental supervision and drinking water issues. Municipalities and ELY Centres have regular meetings on issues such as land-use planning. The ELY Centres actively work with various stakeholders in regional cooperation groups on river basin management planning (see figure 18 in the section on RBMP) and in flood working groups. The Finnish Environment Institute organizes training and seminars for the ELY Centres and other actors. In Finland, people in the water sector know each other well, which facilitates collaboration. Another strength in Finland is the strong capacity and planning tradition in water management.

Figure 14: The organisation of the Finnish administration related to water resources and water quality



Source: Modified from Berninger et al. (2011)

Some interviewees stated that cooperation between the Ministry of Agriculture and Forestry and the Ministry of the Environment could be improved on agricultural water protection issues. Municipalities do not always have a good working relationship with the ELY Centres or other state organizations. There is some lack of trust, and a feeling that cooperation only works when there is a

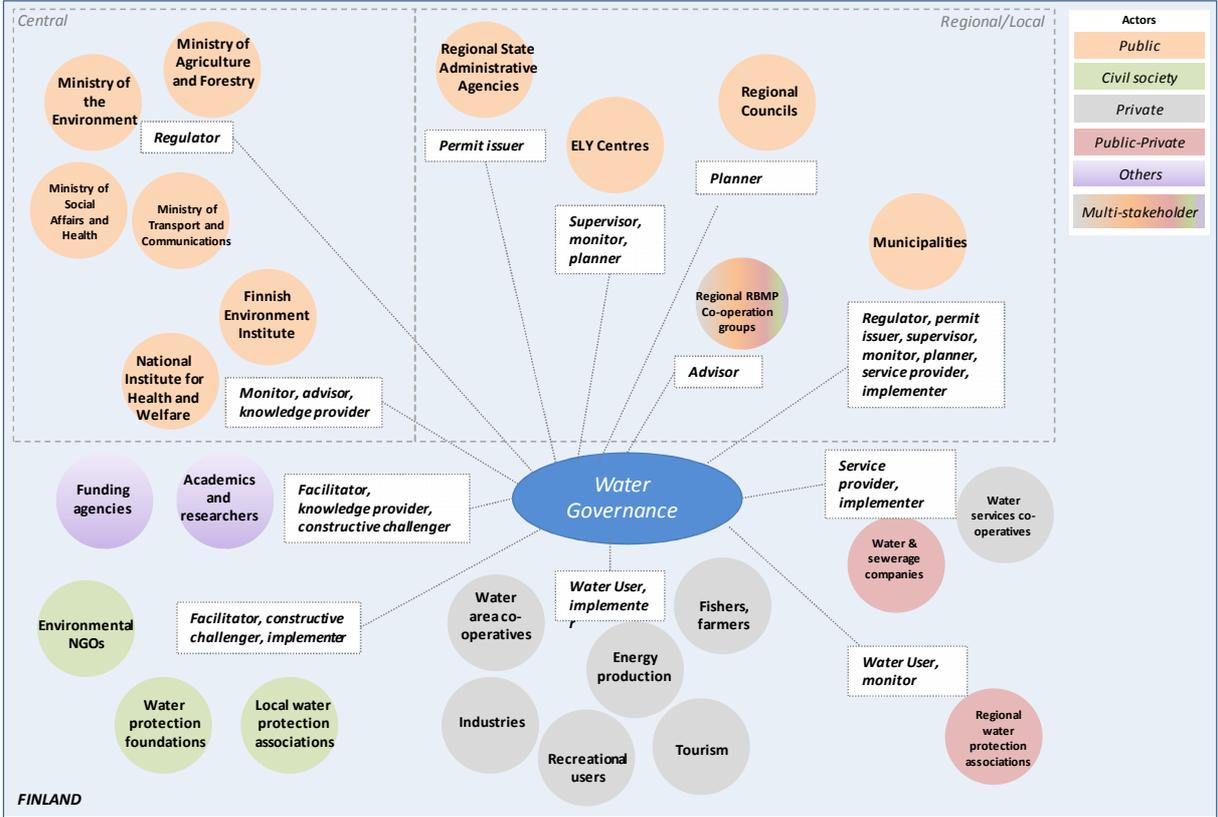
project that the municipality is putting money into. The limited resources in the ELY Centres could explain this situation.

In addition to government actors, various private sector or civil society actors play a role in Finnish water governance. Figure 17 depicts the roles of the key actors identified in this study.

Eleven regional water protection associations cover almost the whole country. They were set up in the 1960s to carry out the monitoring required by the new Water Act. Members include municipalities, industry and the users of water bodies such as fishing organizations and local communities. These associations play an important role in the management of water bodies. They carry out monitoring, and long data sets exist on the quality of some water bodies, for example, in the Kokemäenjoki region. Five of the associations have their own accredited laboratories. These associations are trusted actors with strong regional knowledge. They bring together both the “polluters” and the “users” with the aim of improving the state of the water bodies.

Local water protection associations are genuine grassroots organizations that seek to protect water courses near where people live. They do different kinds of voluntary work to improve water quality or recreation opportunities, such as cutting reeds, fish stock management and improving beaches. The associations also construct wetlands or carry out environmental education by speaking to people or writing about the state of the water and the factors that affect it. The associations draw on the rich Finnish tradition of neighbourhood help and voluntary work. This kind of self-organized community action is a strength at a time of reduced public resources and in a country with abundant lakes and water courses. There is potential to promote community action promoted as a means of water protection.

Figure 15: Division of roles and responsibilities among key actors and institutions



Source: Stockholm Environment Institute 2013

Vesijärvi Foundation is an important actor in water protection and lake restoration in the lake Vesijärvi area. It was founded by three municipalities in the region,⁶³ three local companies and the Industrial Association of Lahti. Funding sources include large companies (16 main supporters), smaller companies and individuals. There is also project funding from different sources.

The Vesijärvi Foundation drafts a four-year action plan for the Lake Vesijärvi area and monitors the implementation. It also carries out research on the impacts of the measures. The foundation also funds activities and provides expertise for the local water protection associations and other actors willing to work for water protection. The foundation directs marketing campaigns to local people. In addition to information, it builds up and maintains networks and matches actors to activities.

The foundation is developing a tool for combining information from different sources. The idea is to motivate citizens to collect information on water quality and use it in monitoring. The Lions Clubs in Lahti region have already carried out a pilot scheme, measuring nutrient concentration in the incoming streams. The results were published in a newsletter.

The *John Nurminen Foundation* promotes combating eutrophication and improving tanker safety in the Baltic Sea. Its main means of reducing nutrient loads in the Baltic Sea is establishing more efficient phosphorus removal at waste water treatment plants in St. Petersburg. The chemical removal of phosphorus is an efficient and simple method that has not previously been used in Russia. The project has shown the importance of concrete measures to the protection of the Baltic Sea. The project on tanker safety is building a control system that resembles air traffic control for tankers navigating the Gulf of Finland, which will be in use by the end of 2013.

Among the environmental NGOs, the Finnish Association for Nature Conservation published its Baltic Sea Programme in 2010. It has regional offices and local environmental associations that play an active role in regional and local settings. WWF Finland launched a campaign for the protection of the Baltic Sea in 2009. It also has its own wetland project that promotes the construction of wetlands (Berninger et al. 2011, 2012).

7.4 Overview of key policies and strategies

Any activity that could potentially cause adverse environmental effects is subject to environmental regulation (Environmental Protection Act 86/2000). An environmental permit is needed, for example, for all industrial activities, sewage treatment, fish farming and larger animal shelters. Water intake and the alteration of water courses are regulated by the **Water Act** (587/2011), and a Water Permit is needed for larger projects. The **Health Protection Act** (763/1994) includes regulations on drinking and bathing water quality and its monitoring.

The national **Water Protection Policy Outlines to 2015** were approved by the Finnish Government in 2006 (MoE 2007). This programme makes the reduction of nutrient loads causing eutrophication the key objective of water protection. The main emphasis is on controlling diffuse pollution, especially from agriculture. A target was set for agriculture to reduce nutrient loads by one-third of the mean load in 2001–2005 by 2015 (MoE 2007). In addition, there is a long-term target to halve the nutrient loads from agriculture as soon as possible. Other areas covered are: reducing the risks associated

⁶³ Lahti, Hollola and Asikkala

with hazardous substances, reducing the harmful impacts of hydrological engineering and water level regulation, protecting groundwater, conserving aquatic biodiversity and water body restoration.

Finland's programme for the protection of the Baltic Sea was approved by the Finnish Government in 2002 (MoE 2002). It touches on various topics, including combating eutrophication, decreasing the risks posed by hazardous substances and reducing the risks caused by different uses of the Baltic Sea. It includes action in Finland and adjacent countries, for example, improving wastewater treatment in St. Petersburg (Tattari and Väisänen 2011).

The **Water Resources Strategy 2011–2020** guides the Ministry of Agriculture and Forestry, ELY Centres and the Finnish Environment Institute in their tasks related to the management and use of water resources (MoAF 2011a). The strategy has four strategic goals: (a) to be prepared for changing climate and water conditions; (b) to ensure a good fit between the objectives on water use and good water quality in the catchment areas; (c) that the work is carried out in a customer-oriented way and based on partnership working; and (d) to ensure that Finnish know-how in the water sector is of an internationally recognized standard. The strategy states, for example, that there will be no new construction in flood risk areas, information on the current water situation will be available for all, and funding will be redirected from water supply into the management of flood risks and water bodies.

Finland's National Strategy for Adaptation to Climate Change (MoAF 2005) outlines the potential impacts of climate change on different sectors of society and suggests adaptive measures. Water protection measures and the efficient use of water will become increasingly important in agriculture. Increased run-off and flooding will cause increased leaching of nutrients, and dry periods will increase the need for irrigation. Flood prevention and management will be approached systematically, by identifying flood risk areas and drafting flood maps. Water and waste water plants will need to increase preparedness for extreme situations of both flood and drought. Small water plants are the most susceptible as well as households and companies that rely on their own wells. One preventive measure would be to increase the coverage of water and sewerage networks. One challenge is that insurance does not normally cover flood damage. The government has created flood damage compensation schemes, but new types of insurance will also have to be developed. Flooding caused by heavy rain is a great challenge in urban planning. The design of proper storm water drains, and the use of floodplains, delay basins and wetlands to prevent flooding will be important. In land use planning the key will be to avoid construction in flood risk areas.

7.5 Experience of policy implementation

▪ *River Basin Management Planning*

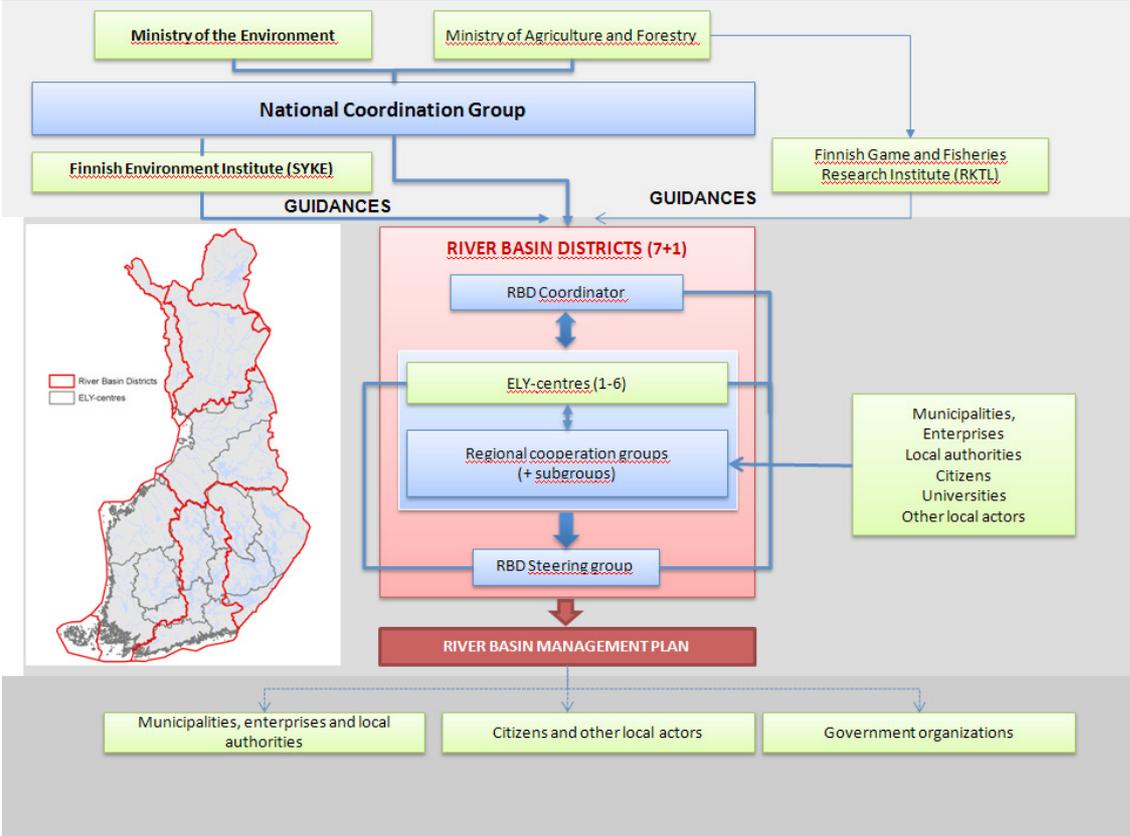
Mainland Finland is divided into seven River Basin Districts (Figure 18). Each district includes the areas of various ELY Centres, but one ELY Centre coordinates the work in the district. Some ELY Centres are involved in various River Basin Districts.

National goals and objectives are integrated into regional work in RBMPs. The national coordination group has worked hard to ensure an equal starting point for all regions. The coordination group has set up several working groups to prepare guidance. The working groups now include representatives working on the Marine Strategy and flood risk management, which helps coordination on these issues.

Each ELY Centre leads a regional cooperation group, which is a legal requirement (Figure 18). The regional cooperation groups include representatives of the municipalities, regional councils, enterprises, regional environmental NGOs and the regional farmers' union. Each group has a representative who is an expert in marine issues. Stakeholder cooperation on the preparation of the Marine Strategy is organized through this body, which means there is no need for separate meetings. The stakeholders are the same in most coastal regions, and the issues are strongly interconnected. The representatives are supposed to link the regional cooperation group to their networks, but information does not always reach the actors concerned.

The River Basin District Steering Group (Figure 18) has members from the environmental section of each ELY Centre, as well as representatives from the fishery section. In order to avoid excessive meetings for some representatives, two River Basin Districts (Vuoksi RBD and Kymijoki-Gulf of Finland RBD) hold their meetings together. In addition, there is a coordination group of ELY Centres with experts from different fields. These experts are responsible for writing different sections of the RBMP.

Figure 16: Administration of River Basin Management Planning in Finland



Source: Tattari and Väisänen 2011.

ELY Centres are responsible for the planning of measures, and have final responsibility for assessing progress with implementation as well as storing monitoring data in the information system (MoE 2012). The Finnish Environment Institute has a significant role in collecting data and collating it for reporting. Other actors submit data on their administrative areas and operations.

Various stakeholders were involved in the planning process for the first RBMPs, and three mandatory public hearings were held (Laurinolli 2010; European Commission 2012). However, involving citizens

in participation was a big challenge due to the scarcity of resources in the ELY Centres (Laurinoli 2010). These resources are decreasing rather than increasing due to measures to balance the national budget. This means that public participation may be limited to active citizens and stakeholder groups. A study is in preparation on how to increase and improve public participation.

There were public hearings on the second round of RBMPs in 2012. A web-based opinion survey was also used to collect the views of the public. Two hearings on the work programme and timetable and the main issues to be dealt with were combined, which saved a lot of working time and made it easier for people to participate. Summaries of the feedback are being drafted and nationally coordinated answers will be given on the most important issues raised. In 2014, the public hearings for the RBMPs, Marine Strategy and flood risk management plans will be held at the same time. This avoids different hearings on similar issues being held in various occasions.

The Government approves all RBMPs. The RBMPs and their Programmes of Measures are not legally binding, but they are supposed to guide civil servants in their decisions concerning environmental permits, plans, and so on. Implementation plans are also drafted for the Programmes of Measures, enabling better definition of responsibilities and sources of funding. In some regions, such as South Savo, the implementation plans are drafted for smaller areas, while in other regions, such as Southeast Finland, there is a single implementation plan. Smaller planning units can facilitate implementation.

The interviews with local actors revealed that the regional RBMPs will probably not be implemented unless there is a more detailed and concrete action plan at the local level. For example, the Vesijärvi Foundation (see above) regularly drafts action plans for Lake Vesijärvi with estimates of funding needed for each activity. It also funds these activities and follows up on implementation. In many other areas this local level implementation of the plan is absent.

- *Marine Strategy*

The Marine Strategy is included in the same act as the RBMP (Act on Water Resources Management 1299/2004). The Ministry of the Environment has overall responsibility for the Marine Strategy, but the Ministry of Agriculture and Forestry and the Ministry of Transport and Communications are also involved.

The Southwest Finland ELY Centre coordinates the work related to the Marine Strategy among the ELY Centres. There is a single strategy for all Finnish marine areas – there are no official zones or regions. The Marine Strategy must take RBMPs into account and vice versa. The Marine Strategy considers partially new areas, such as fish, the seabed and underwater noise.

The government approved the first part of the Marine Strategy in December 2012 (GoF 2012a). Citizens were invited to comment on the draft document in April–May 2012 (mandatory hearing). There is no formal stakeholder participation in the Marine Strategy process. Stakeholder participation is integrated in the RBMP process, as is explained above.

- *Flood risk management*

In December 2011 the Ministry for Agriculture and Forestry named 21 areas (17 inland and four coastal) where there is a significant risk of flooding from water courses or the sea. The areas were identified by the ELY centres. Flood working groups set up by the ministry will draft flood maps and flood risk management plans for each flood risk area by 2015. The flood working groups are led by the regional councils, and have representatives from the ELY centres, municipalities and rescue

services. There are no stakeholder representatives on the working groups. A public hearing (mandatory) will be organized on the flood risk management plans. Some regional or municipal climate change strategies include an adaptation strategy, e.g. the climate change adaptation strategy for the Helsinki metropolitan area (HSY 2012).

- *Water protection in agriculture*

The main policy instrument for agricultural water protection is the agri-environment payment system, which covers about 95 % of Finnish farmers. In the Finnish agri-environment payment system, the share of water protection measures is higher than in most other EU countries being 67 % of basic measures, 90 % of additional measures, and 46 % of special measures (Berninger 2011). The rural development programme also includes non-productive investment support for wetlands (Berninger et al. 2012).

An extensive stakeholder participation process for the new planning period has been under way since the end of 2011. Ten expert working groups with about 200 people involved are preparing different parts of the system. Their recommendations will be made to the official agri-environment payment group. Four expert groups discuss issues connected to water protection: the nutrient group, the plant cover group, the treatment of outflowing water (including wetlands) group and the investment group.

Animal rearing is subject to an environmental permit procedure, which regulates the design and size of manure storage and waste management. The Nitrates Decree (931/2000) regulates the spreading of manure and fertilizers.

The Ministry of Agriculture and Forestry and the Ministry of the Environment fund projects to improve water protection in agriculture, e.g., the TEHO and TEHO Plus projects operating in Southwest Finland. The Järki project is a joint effort by the Baltic Sea Action Group and the Nature and Game Management Trust.

- *Groundwater*

Groundwater has been mapped and classified since the 1970s. Groundwater areas are classified into three categories according to their suitability for water intake and their protection needs: class I, important; class II, suitable for water intake; and class III, other groundwater areas (GoF 2012b). It is possible to form a protection zone around a groundwater intake plant in order to ensure the quantity and quality of the source. This is regulated by the Water Act (587/2011). Protection zones have been assigned to 220 groundwater areas, covering 11 % of all groundwater intake plants. (GoF 2012b)

Municipalities can draft protection plans for important groundwater areas. ELY centres are important partners and also partially finance this work. These protection plans are guidelines used as background information by authorities. (GoF 2012b) The regulations related to these protection plans are under review. It has been suggested that the protection plans should be included in River Basin Management Plans and regulated by law.

- *Water supply and sewerage*

Water supply and sewerage policies aim to ensure the availability of good quality drinking water, and that waste water is efficiently collected and suitably treated to acceptable standards. Pricing policies exist to keep the costs of the water supply and connection to sewerage systems reasonable and are fair (SYKE 2009). The Health Protection Act (763/1994) includes regulations about household water quality and its monitoring.

The **Water Resources Strategy 2011-2020** (MoAF 2011a, see above section general policies and strategies) and the **Outline for developing water and wastewater services** (Silfverberg 2007) guide the water supply and sewerage services. The latter defines criteria for a good water service, identifies trends on, for example, the effects of climate change, and outlines key actions such as improving risk management in storm situations and the need to form regional units instead of local units (see below). In addition, waterworks have their own strategies on security of supply, among other things.

The Water Supply and Sewerage Act (119/2001) makes municipalities responsible for water supply and sewerage services in their area. Municipalities are required to devise and update **a water supply and sewerage plan** and to take part in regional planning on the subject. Waterworks are responsible for the service in their area. They are usually municipal enterprises, but they can also be municipal departments or joint municipal organizations. Local residents can also organize water and waste water services as a cooperative in sparsely populated areas that are not covered by municipal pipelines.

The current trend is towards larger organizational entities, which are more efficient in the provision of these services. One example is Helsinki Region Environmental Services, founded in 2010 by the merger of the municipal waterworks in Helsinki, Espoo, Vantaa and Kauniainen. This was a logical development since they already had some common pipelines and were cooperating closely. It was a challenge to harmonize the different ways of working in each city. There is also a trend for smaller waste water treatment plants to be closed down, taking waste water to more efficient larger plants.

Waterworks cooperate with the municipal authorities responsible for land-use planning and the civil servants at the technical department, since pipelines in new housing developments are constructed at the same time as streets. The cooperation between waterworks and supervising authorities works well. This is due partly to the long experience of cooperation and partly to the Water Supply and Sewerage Act, which clearly defines the tasks and responsibilities of each organization. It was drafted in close cooperation with water professionals.

The Water Supply and Sewerage Act is being revised and a draft is currently out for consultation (MoAF 2013). The revisions suggest making the management of storm water the responsibility of municipalities, rather than the waterworks which is the situation at the moment. There would also be standard compensation for interruptions of service of longer than 12 hours. Waterworks would be responsible for knowing the condition of their network.

A significant challenge in waste water treatment is the removal of nitrogen by small inland treatment plants, where the removal percentage is still only 30 %. Nitrogen is not a limiting factor in inland waters, but it is in the Baltic Sea. This makes its removal important in the basins of rivers that flow to the Baltic Sea. The problem is slowly being resolved as small waste water treatment plants are replaced by larger and more efficient plants.

Government Decree 119/2011 (originally issued in 2003) regulates the treatment of domestic wastewater in areas outside sewer networks. It is an example of how a regulation should not be prepared. The municipalities had no resources for its implementation and were unable to give the advice needed to the households. All households were obliged to treat their waste water, not only those living near water courses. The technology required was not functional, and cesspools were not allowed in some areas even if they were the best technical solution. People bought expensive devices that did not work properly. One result was that water service cooperatives were formed in areas far from municipal networks: a very expensive solution.

- *The restoration of water courses*

The **Water restoration strategy (2012)** has several objectives, to: improve the quality of water, secure biodiversity, strengthen cooperation networks and partnerships, improve opportunities for independent restoration, help state organizations to promote restoration and support other actors. In addition, it seeks to ensure new sources of funding for restoration, that the effects of restoration activities are assessed and more information is gathered, that restoration projects are supported in an uniform way, and that the capacity built up in water restoration projects can be exported.

People are increasingly interested in participating in restoration activities. The most successful activities are based on local initiatives and cooperation by diverse actors, such as a village association, a regional water protection association, an expert and a municipality. It is important to have all the factors that affect water quality covered in the cooperation network. Co-funding is also important since state funds are not sufficient.

Limiting internal loading by managing fish stocks or aeration is in many lakes more effective than reductions in external loading alone.

One example of a restoration project is Lake Matalajärvi in Espoo, where the local water protection association has collected money for a project in cooperation with the Uusimaa ELY Centre and the city of Espoo, which have both co-funded the project and provided expertise.

- *Nutrient Recycling*

The Finnish Government made a commitment at the Baltic Sea Action Summit in Helsinki in 2010 to improve the State of the Archipelago and to become a model region in the recycling of nutrients. The nutrient recycling working group submitted its report, including recommendations, in 2011 (MoAF 2011b). The main targets of the recommendations are:

1. The economic and effective use of nutrients, including on-farm measures and promoting the use of manure and organic fertilizer products,
2. Minimizing biowaste, including decreasing food waste by supermarkets, etc.,
3. The efficient and safe recycling of nutrients including no biowaste to landfills, more efficient treatment of manure, and the safe use of sludge from waste water treatment plants,
4. Removing nutrients from water courses and recycling them for use, including fish stock management by removing less valuable fish and promoting its use, and the use of reeds as green fertilizer or an energy crop.

Project funding is available for innovative pilot projects to promote nutrient recycling and/or improve the state of the Archipelago Sea. The sum available for this purpose in 2013 is EUR2.3 million. A monitoring group will follow up implementation.

- *Monitoring of water resources and water quality*

The Finnish Environment Institute is responsible for monitoring water resources, water quality and loading (Figure 16). The practical work of running measuring stations and taking samples is carried out by the ELY Centres. Sometimes private entities or individuals are hired to take samples.

The Finnish Environment Institute coordinates the monitoring of water resources, collecting information from all available sources,⁶⁴ analysing and collating the data. It produces a hydrological

⁶⁴ For example, the Finnish Meteorological Institute, ELY Centres, industry and municipalities.

model, which is used to describe the current hydrological situation and to make hydrological forecasts. One of the system's strengths is that it produces forecasts with a probability distribution, rather than just a single forecast. A localized forecast is freely available on the Internet for 1000 locations. Another strength is the open administrative culture. The data and modelling results are made public and available to all: even the hydropower sector makes its current data available⁶⁵. The Institute also issues flood and water level warnings, as well as precipitation warnings, snow load warnings for roofs and information on the ice cover⁶⁶.

Monitoring water use presents several challenges. There is no single database on water use, and information must be collected from various sources. There is no international standard definition of water use. Thus statistics on water abstraction sometimes include hydropower and/or power plant cooling water and sometimes not.

The Finnish Environment Institute also coordinates water quality monitoring. New measuring technology is in use at several locations, for example automatic measuring stations and continuous measuring devices drawn behind boats. The monitoring results of the environmental authorities and industry as well as other relevant data are available on the OIVA Internet site, which is targeted at experts. Use is free of charge, but registration is required. It is one of Finland's strengths that long data series are available on water quality, as well as high quality GIS and remote sensing material which has been systematically organized and analysed to produce easily accessible and readily available products. There is also good quality material on land use, e.g., CORINE satellite maps have been processed with agricultural parcel data. The national data available today are better than they were 10 years ago thanks to cooperation between state research institutes in the LYNET research consortium.⁶⁷ The EU WFD requires new types of information. Nonetheless, there is a risk that the number of data collection points or amount of time series data will be reduced due to the state economy drive and pressure to save costs.

Local environmental authorities have a legal responsibility to be aware of the state of the environment in their area.⁶⁸ They monitor water quality in their area according to need and the availability of resources. The data are sometimes shared with the state authorities, while in other cases they are for local use only.

7.6 Key innovations for cross-sectoral integration and collaboration

As a part of the river basin management planning process, the Finnish Environment Institute has developed an excel-based tool for assessing the potential benefits of different packages of measures in the Programmes of Measures for sub-river basins. The tool focuses on water quality issues in surface water and is currently at the testing phase. The tool will be used in each ELY Centre and regional cooperation group to ensure that different objectives are taken into account in their analyses. The assessment includes nine benefit categories. Their importance and sensitivity to

⁶⁵ Hydrological forecasts and maps are available at <http://www.ymparisto.fi/default.asp?contentid=404852&lan=EN>

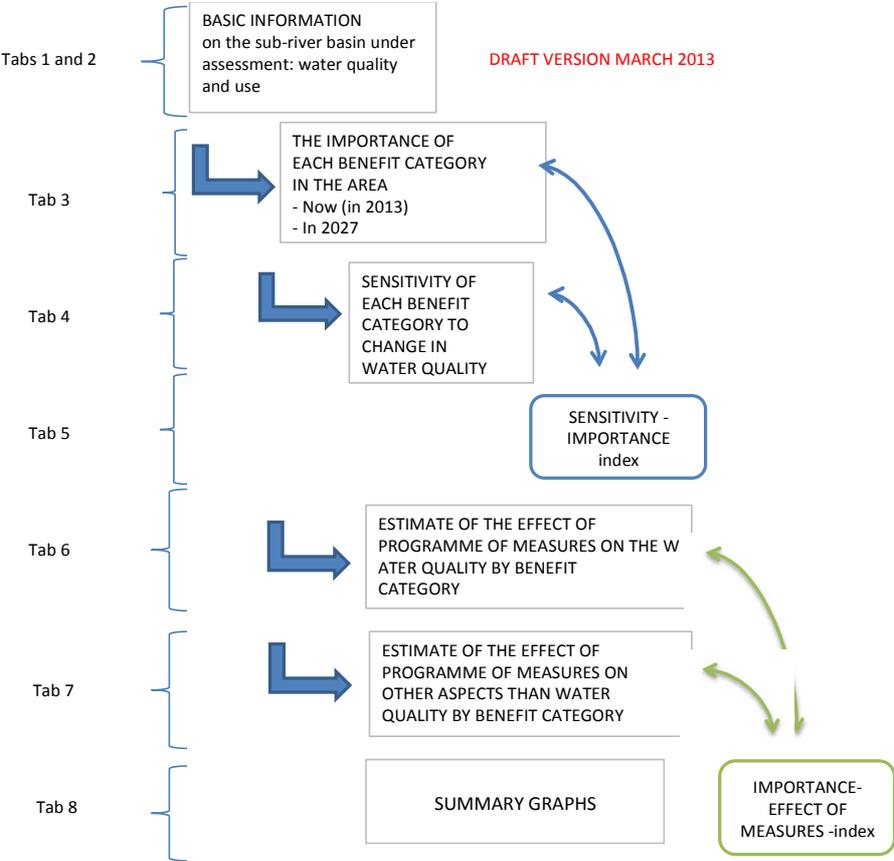
⁶⁶ For more information visit: www.ymparisto.fi

⁶⁷ Includes MTT Agrifood Research Finland, the Finnish Forest Research Institute (Metla), the Finnish Game and Fisheries Research Institute (RKTL), the Finnish Geodetic Institute (FGI), the Finnish Food Safety Authority (Evira) and the Finnish Environment Institute.

⁶⁸ Environmental Protection Act (86/2000) and the Act on Environmental Administration in Municipalities (64/1986).

changes in water quality are assessed, and the potential effects of the proposed measures on these benefits are estimated (Figure 19).

Figure 17: Draft structure of the assessment tool



Source: Finnish Environment Institute 2013

Järviwiki (SYKE 2011) contains basic information on all Finnish lakes over 1 ha in size. Any registered user can add relevant information on a certain lake. Water quality data are available for all users. A search on the lake name “Juojärvi” in the Vuoksi main catchment area, e.g., will yield information fed by a regular user on the surface water temperature, depth of visibility, existence of algal blooms and ice cover.

The Finnish government uses a discussion forum at www.otakantaa.fi to give all its citizens an opportunity to comment on legislation and development projects. The platform enables surveys, commenting on draft documents and free discussion. For example, a discussion on the topic “Rural areas 2020: How can we make work on environmental protection in agriculture more effective?” was open between 14 February 2013 and 6 March 2013.

8 Estonia

8.1 Historical trends for water governance

The basis of water governance and legislation can be traced back to the 1920s and 1930s in Estonia. The hydrological monitoring network for Estonian rivers and lakes was established in the 1920s. In the Soviet era, water management was centrally planned from Moscow with no consideration for local circumstances. The institutional system was reorganized several times. Censorship meant that pollution load data either remained confidential or were underestimated. Water supply and wastewater facilities were state-owned. One significant achievement on water protection in the early 1960s was the water management long-term plan to 1980 (Velner 2003). In the second half of 1980s, an active environmental movement was started in Estonia to resist central government plans for phosphate rock mining in northern Estonia, which would have had devastating consequences for local water resources and quality. This was also one of the key drivers for subsequent political change.

There have been two major reforms of water management since Estonia regained its independence in 1991. In 1990s the main focus was to elaborate a national legislative system for water management. This included the establishment of ownership rights for water bodies and the water infrastructure, and the privatization of infrastructure. Major structural reforms took place, including adopting the principles of a market economy. The second phase of reforms in 2000–2010 was to shift direction towards the European Union’s environmental requirements in the context of the EU accession process. The state government was mainly involved in the reforms of the early 1990s, but the involvement of other stakeholders was more visible in the second phase of reforms (Lääne and Reisner 2011).

Table 4: Country specific information

Total population ^A	1 339 662
Population density (per square kilometres) ^B	29.6
Urban population, percentage ^C	69.5
Surface area square kilometres ^C	45 227
Length of coast , kilometres ^D	3 794
Area of coastal and transitional water bodies, square kilometres ^E	14 501
Number of river water bodies ^F	645
Total length of river water bodies, kilometres ^F	12 106
Number of lake water bodies ^F	89
Total area of lake water bodies, square kilometres ^F	1 966
Total area all surface water (rivers, lakes, transitional and coastal waters), square kilometres ^G	16 493
Number of river basins ^H	3
Number of shared river basins ^H	2
Renewable fresh water resources (precipitation and external inflow less actual evapotranspiration), millions of cubic metres ^I	14 404
Total gross freshwater abstraction, millions of cubic metres ^J	1 388
Freshwater abstraction per capita, cubic metres (Total gross freshwater abstraction divided by total population)	1 036

Sources: ^AEurostat,(2012), ^BEurostat,(2010), ^CUN data,(2013), ^DCIA,(2009), ^EMinistry of the Environment Estonia, (2010), ^FEEA,(2009a), ^GEEA,(2009b), ^HEC,(2012d), ^IEurostat,(2013), ^JUN Statistics Division,(2010b)

8.2 Water resources for people and nature

Estonia's climate, where annual precipitation exceeds evaporation, and its small population, mean that it has sufficient freshwater resources in underground aquifers and freshwater lakes and rivers. However, water resources are unevenly distributed and North Estonia is relatively poor in water. There are thousands of small rivers, streams and lakes in Estonia and most of them are accessible and free for public use. Because most Estonian water bodies are small and relatively low in water quantity, however, they are extremely susceptible to pollution. Only 11 rivers are longer than 100 km and 14 have catchment areas that exceed 1000 km². A little over 1200 lakes have a surface area of 1 ha or above. About half of Europe's fifth largest natural lake (Lake Peipsi) is located on Estonian territory. Estonia's long coastline (3792 km) means that the sea has been used historically for livelihoods, seafaring and tourism. Its flat topography (the average height above sea level is approximately 50 m) supports a number of wetlands – about 5.5% of Estonian territory is mire, where the peat layer is more than 30 cm thick (ELF 2011). Approximately half its territory is forest land and one-third is agricultural land.

The main projected hazards and economic losses in the context of climate change are related to water: sea level rise will cause flooding in coastal areas, the erosion of sandy beaches and the destruction of harbour constructions. A number of valuable natural ecosystems will be endangered, in both marine and terrestrial systems (Ministry of the Environment 2009). Significant changes in water bodies are projected by the end of the 21st century: increasing temperatures will considerably alter the hydrological regime of inland water bodies; storm water infiltration of groundwater will increase significantly; the Baltic Sea environment will be most affected by wind and temperature changes; and increasing temperatures will help spread invasive species which could have unforeseen consequences for the whole ecosystem (Estonian University of Life Sciences 2012).

Estonia is divided into three river basin districts and eight sub-river basin districts:⁶⁹ East Estonia (the sub-river basins of Viru, Peipsi and Võrtsjärve), West Estonia (the sub-river basins of Harju, Pärnu, Matsalu and Läänesaarte) and Koiva (a small part of a large area located mostly in Latvia). The Pandivere groundwater sub-river basin is one-third in the West Estonia and two-thirds in the East Estonia river basin district.

The biggest water user is the energy supply sector, where water is used as a coolant, followed by the domestic sector, industry and agriculture. The energy sector, including the Narva Power Plants, consumes approximately 94% of the total water used in Estonia, the domestic sector 3%, industry 2% and agriculture 0.3% (EEIC 2011). The main instruments for reducing water use and the discharge of pollutants into the environment are the water permit system, for activities which have a significant impact on the use and protection of water, and taxation. Estonia introduced a water pricing policy in 1991. The fee for the use of water and pollution charges, based on the Act on Environmental Charges (2005), are increasing annually, which has resulted in a decreasing trend of water consumption in the domestic and industrial sectors. In recent years, however, extraction of surface water has started to increase once again (EEIC 2013).

Three-quarters of Estonian watercourses and two-thirds of monitored small lakes have good ecological status (EEIC 2013). The three main problems with surface water are diffuse pollution from agriculture, the blocking and impounding of flowing water and point source pollution from

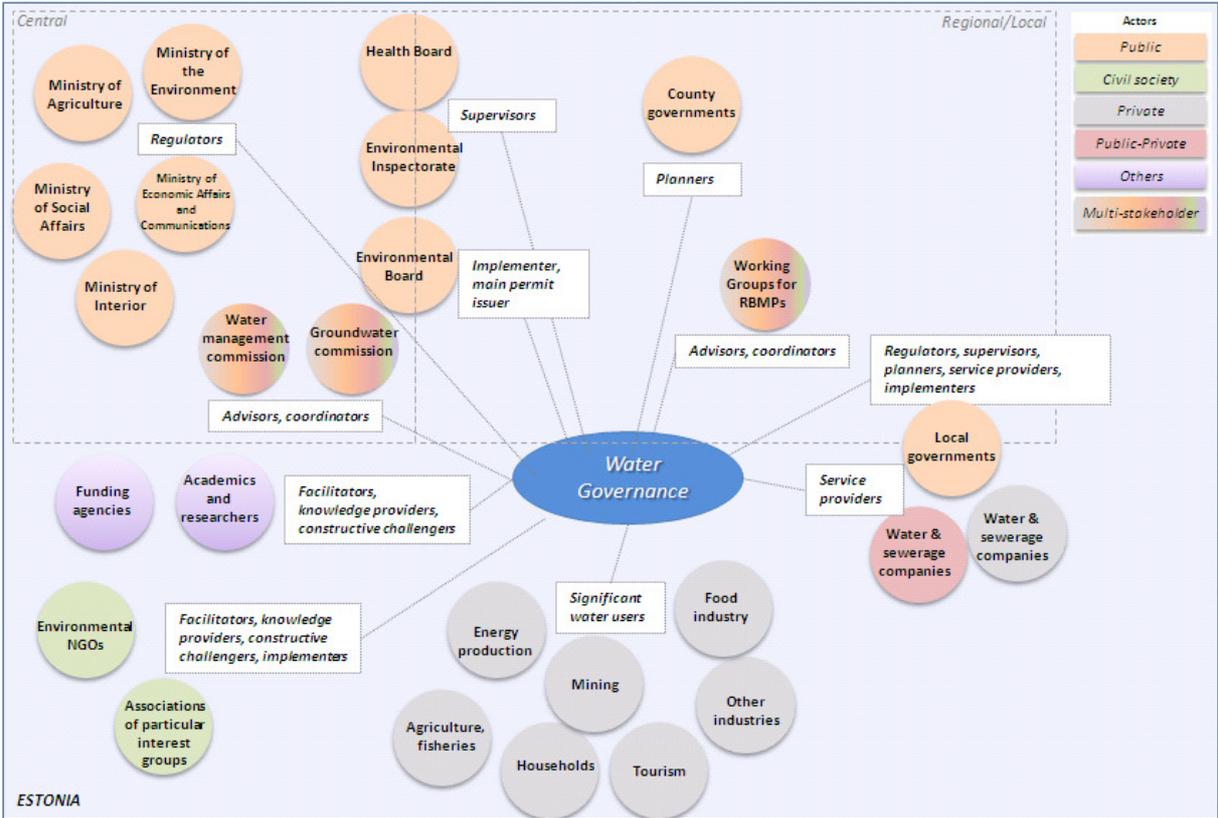
⁶⁹ Regulation of the Government of the Estonian Republic no. 132 of 9 September 2010

wastewater. In some places there is also overuse of groundwater. Nitrate concentration in groundwater in the Nitrate Vulnerable Zone in Central Estonia has started to increase again after falls in 2009–2010. This presents risks for the ecological status of water bodies as well as for drinking water in areas of low population density (EEIC 2013).

The moderate ecological status of the majority of coastal waters stems from the nutrient load originating from both Estonian territory and neighbouring countries, as well as from pollution that has accumulated in the Baltic Sea over decades which has led to severe eutrophication of the entire Baltic Sea (EEIC 2013). Estonia’s emergency risk assessment sees large-scale marine and coastal pollution from ships as the highest risk emergency facing the state. The likelihood of such an emergency is evaluated as high and its consequences as severe (Ministry of Interior 2011). However, an oil spill prevention fund, which could gather fees from each tonne of oil transiting Estonian ports, has not been established.

8.3 Institutional overview and key actors

Figure 18: Division of roles and responsibilities among key actors and institutions



Source: Stockholm Environment Institute 2013

- *The Ministry of the Environment and its jurisdiction*

The responsibilities of the public sector include preparing and enforcing of legislation, planning water protection measures and issuing water permits. The **Ministry of the Environment (MoE)** is responsible for the development and implementation of water protection and water use policy with regard to groundwater, surface water and the marine environment. These issues are coordinated by the Water Department and the Marine Environment Department in the ministry. The Fisheries

Resources Department manages and coordinates research into and assessments of the exploitation, reproduction and protection of fish resources. The MoE is the competent authority for all the river basin districts on Estonian territory. A centrally coordinated national approach has been taken to implementing the WFD uniformly in all three river basin districts (EC 2012).

The Environmental Board, a governmental agency of the MoE consisting of six regional units, implements the state's policies on the environment and nature conservation. The Board coordinates the implementation of RBMPs, is the administrative authority for protected areas, including those at sea, and is the main permit issuing authority for, among other things, water permits. The MoE issues the water permit directly only in exceptional circumstances for the special use of sea water and border lakes. There are two main types of environmental permit in Estonia:

- An *Integrated environmental permit (IPPC)* issued to allow the release of substances into the air, water, soil or groundwater and to manage waste;
- A simple *permit for the special use of water*, an ambient air pollution permit or waste permit, to allow the use of natural resources or the release of pollutants from a single source or for waste management.

The simple water permit is issued for a maximum of five years. There are three water management coordinators in the Environmental Board – one for each river basin district.

The Environmental Inspectorate has four regional units. It is a governmental agency under the MoE which undertakes supervision in all areas of environmental protection, including water protection and fishing in all inland water bodies and the Baltic Sea. In addition to water bodies, it also supervises all operations related to fish handling, such as purchases and sales, and the transportation and processing of fish (Estonian Fisheries Strategy 2007–2013). The Inspectorate deals with environmental violations, and since 1 September 2011 has also carried out investigations in criminal cases.

In addition to the institutions in Figure 20, there are also other administrative actors in the MoE that have important roles in water governance. **The Estonian Environment Information Centre (EEIC)** is a state agency administered by the MoE which collects, analyses and distributes environmental information. Its water database encompasses springs, flowing bodies of water, stationary bodies of water, marine areas, wells and water intakes. It distributes information on the use of surface water and groundwater, the pollution loads for bodies of water and water quality. The **Estonian Meteorological and Hydrological Institute (EMHI)** gathers, analyses and stores the results of hydrological measurements, among other things. In February 2013, the MoE initiated the establishment of a new state agency responsible for implementing the state environmental monitoring programme, assessing and reporting on the state of the environment, and weather observations and forecasts. The ministry's aim is to clarify the functions of its administrative area..

The Estonian Environmental Research Centre is, inter alia, a reference laboratory in the field of wastewater. The centre performs wastewater, surface water and sewage sludge studies. The **Geological Survey of Estonia** provides geological services, analyses and inventories of groundwater and mineral resources.

▪ *Other ministries and their jurisdiction*

The Public Health Department of the **Ministry of Social Affairs** designs and implements health policy to ensure the safety of drinking and bathing water. Legislation to regulate drinking water quality is

enacted by the Minister of Social Affairs. The **Health Board** implements state monitoring and supervision of drinking water, natural mineral water and bathing water.

The **Ministry of Agriculture** (MoA) aims to set the conditions for the sustainable and diverse development of Estonia's agriculture and fishing industry and for rural development. The **Agricultural Registers and Information Board** (ARIB) is the payment and auditing authority for Estonian Rural Development Plan (ERDP) subsidies and payments made under the supervision of the MoA. Evaluation of the Axis II⁷⁰ measures of the ERDP (including water quality) is carried out by the **Agricultural Research Centre**. Three water quality indicators were monitored for the ERDP in 2004–2006 and 2007–2013: the balance of plant nutrition elements, pesticide use and plant nutrient concentration in drainage water.⁷¹ The tasks of the **Agricultural Board** include compiling the management plans for land improvement systems. Under contract from the MoA, the **Rural Development Foundation** develops and manages the Advisory Service, which has centres in each county. However, as of March 2013, only one of the more than 140 agricultural support advisers was a specialist in the environment and nature protection issues.⁷²

The **Ministry of Economic Affairs and Communications** elaborates and implements the state's economic policy and, more specifically, its economic development plans in maritime affairs. One aim of the **Estonian Maritime Administration** is to ensure safe navigation in Estonian territorial and inland waters. Before the adoption of a spatial plan, consent for planned construction in a public water body is needed from the **Estonian Technical Surveillance Authority**. Since November 2010, the prices of water services have had to be approved by the **Competition Authority**. Before local government councils approved the prices. The Competition Authority draws up and recommends principles for the method for calculating prices.

The functions of the **Ministry of the Interior** are, inter alia, to oversee spatial planning, including in marine areas and other water bodies, and to develop marine pollution control and marine rescue policies. The **Police and Border Guard Board** coordinates marine pollution control and marine rescue work. Rescue activities on inland water bodies and coastal waters, in cooperation with the Police and the Border Guard Board, are among the responsibilities of the **Rescue Board**.

The foundation **Estonian Environmental Investment Centre (EIC)** is founded by the **Ministry of Finance**. It channels environmental fees from the state budget and finances from the EU structural funds and foreign support programmes into environmental projects, including various activities concerning water management, and grants loans for this purpose. The EIC coordinates the larger and more costly projects within the Programmes of Measures of the RBMPs. Its decisions on the selection of projects and their focus are coordinated with the MoE (EEIC 2010).

- *County and local government*

The **county governments** coordinate sectoral policy activities at the regional level. The main water governance task of coastal county governments is to prepare county marine spatial plans and their strategic environmental assessments. All county governments supervise the drafting of local level spatial plans.

⁷⁰ *Axis II measures aims to improve the environment and the countryside*

⁷¹ *Agricultural Research Centre, Evaluation topic areas: water,*

<http://pmk.agri.ee/pkt/index.php?valik=4100&keel=1>

⁷² <http://www.pikk.ee/nouandeteenistus/konsulendid>

The main water management tasks of **local government** are set out in the Local Government Organization Act, the Water Act and the Public Water Supply and Sewerage Act. They include organizing the supply of water and sewerage, granting consent for permits for the special use of water, arranging the implementation of the Programme of Measures, flood risk management and protecting water quality in their administrative area.

- *The Private sector*

The private sector participates in the provision of water services. There are a relatively large number of small waterworks in the Estonian water supply sector. Water services are provided by publicly owned water companies in most cities and towns. Other types of provision exist in the smaller towns and rural municipalities, such as specialized water companies with mixed, public and private, ownership, production delegated to private companies, or direct production by local government agencies or departments. In Tallinn, a majority share in the water services company was sold to international partners and later listed on the stock exchange (Peda 2012). In Tartu, the second largest city, the local waterworks belongs 100% to the city and cooperation between them is going well.⁷³

The **Estonian Water Works Association**, founded in 1995, is an umbrella organization for water companies and water management companies.

- *Civil society*

Examples of activities by the **Estonian Council of Environmental NGOs** (EKO) include taking part in the Common Agricultural Policy and Rural Development Plan processes and lobbying for better marine spatial planning. Several NGOs have specialized in water protection issues, such as Estonian Fund for Nature, Wildlife Estonia and the Rivers Rehabilitation Society.

- *Governance tools*

Governance tools for river basin management. At the national level, the Minister of the Environment established a **water management commission** in June 2011 to coordinate the different sectors.⁷⁴ For example, it provides an opinion on draft RBMPs and coordinates the implementation of the Programmes of Measures. The commission has 14 members: (a) seven representatives of ministries, four – including its chair – from the Ministry of the Environment, and one each from the Ministry of Social Affairs, the Ministry of Agriculture and the Ministry of Economic Affairs and Communications; (b) four representatives of the administrative agencies within the ministries, one each from the Environmental Board, the Environmental Information Centre, the Health Board and the Agricultural Board; (c) two academics, one from Tallinn University of Technology and one from Tallinn University; and (d) one representative from the business sector, the Estonian Water Works Association.

At the river basin level, **Working Groups on RBMPs** were established for each of the three river basin districts by a Ministry of the Environment Directive of 30 March 2010. These working groups meet on average once or twice a year to coordinate the implementation and updating of the RBMPs. To ensure sufficient representation of stakeholders, the following representatives are invited as a minimum to join the working groups: the MoE, county government and local government representatives in the river basin district, the Agricultural Board, the Health Board, representatives of producers, water works, environmental NGOs and relevant experts. Involvement of stakeholders is

⁷³ Interview with local authority representative

⁷⁴ <http://www.envir.ee/vmk/veemajanduskomisjon>

organized by the Environmental Board, which has developed an action plan for public involvement in RBMPs.

The working groups have an advisory role. They discuss and make proposals on the implementation and revision of RBMPs and other related activities. They also exchange information and make recommendations to the MoE on project proposals submitted to the water management Programme of Environmental Investment Centres. There are plans to give working groups more specific additional tasks. The meetings of the working groups are open to all interested persons.

Governance tools for groundwater issues. The Groundwater commission in the MoE coordinates groundwater resources, studies and expertise. The commission has representatives from the Ministry of the Environment, the Environmental Board, the Geological Survey of Estonia, Tallinn Technical University, an environmental management company and a water company.⁷⁵ The state regulates groundwater use and safeguards it, but it does not own it. The 2003 amendment to the Law of Property Act makes groundwater a common good which has no single owner.

Governance tools for the marine environment. In 2005, an **inter-ministerial Marine Commission** was set up by the Government order under the Ministry of the Environment to coordinate the activities of the different ministries engaged in marine issues. The Commission completed its work in 2011. The Estonian Maritime Policy, 2012–2020 states that there is a need for a more efficient marine commission with new working procedures. An **expert group** consisting of scientists and MoE officials has been formed to prepare a Marine Strategy.

Governance tools for transboundary cooperation. Estonia is a contracting party to **HELCOM**, the Convention on the Protection of the Marine Environment of the Baltic Sea Area.

Coordination of the river basin management plan for the East-Eesti river basin district is carried out within the framework of the cooperation agreement for the joint management of Estonian-Russian watercourses. The **Estonian-Russian Joint Commission for the Protection and Economical Use of Transboundary Water Bodies** was set up in 1997. It has two expert level working groups: on integrated water resources management; and monitoring, assessment and research. The transboundary workplan is revised every two years.

Estonia has also been involved in international cooperation with Russia in managing the fish stocks in lakes Peipsi, Lämmijärv and Pihkva since 1994. **The Intergovernmental Commission on Fisheries** meets twice a year and levels of fishing activity in these lakes are agreed for periods of six months. From the Estonian side, fishery resource studies are conducted by scientists at the Estonian Marine Institute at the University of Tartu, who make recommendations to the Commission in cooperation with Russian scientists on managing fishery resources (Estonian Fisheries Strategy 2007–2013).

International cooperation with Latvia has been ongoing since 2001 within the framework of expert meetings. Cooperation on managing the Koiva international river basin district is based on an agreement between the Ministry of the Environment of the Republic of Estonia and the Ministry of the Environment of the Republic of Latvia (Ministry of the Environment 2010).

⁷⁵ Directive of Minister of the Environment, No 847, 15.06.2011

Table 5: Summary of authorities responsible for implementing elements of the WFD and the MSFD

Area of WFD and MSFD-related responsibility	Competent Authority / main coordinating authorities	Supporting authorities
WFD implementation (overall) MSFD implementation	Ministry of the Environment	
RBMP and PoM preparation	Ministry of the Environment	Water Management Commission, Working Groups of River Basin Management Plans Environmental Board, Estonian Environment Information Centre,
Monitoring	Ministry of the Environment	scientific and research organizations, Ministry of Social Affairs
Permitting	Environmental Board, Ministry of the Environment	
Supervision	Environmental Inspectorate	Environmental Board, local municipalities, Health Board

Source: Based on Water Research Centre (WRC), 2012

Governance tools for integrating the environment, water and rural development planning. To prepare the Rural Development Plan, 2007–2013 and a new plan for 2014–2020, the Minister of Agriculture convened a **Leading Committee for the Estonian Rural Development Plan** to formulate Estonia’s position on EU CAP rural development support mechanisms and make proposals on the measures. Its members are from different ministries and their agencies, farmers’ and agricultural producers’ associations, the food industry, the union of private forest owners, small and medium-sized enterprises, the association of municipalities, the tourism sector, research institutes, the village movement and EKO.

A **thematic working group on water and soil** is developing measures for the Rural Development Plan, 2014–2020. Fourteen thematic working groups have been set up from members of the Leading Committee and other stakeholders. A representative of the Water Department of the MoE participates in the working group on water and soil. The MoE was also represented in the development of the ERDP measures for the previous financing period. EKO has analysed the involvement of stakeholders in the process of developing the new Rural Development Plan 2014–2020 and concluded that although many stakeholders have been involved, it cannot be said that different interests are balanced in the process. Nature and environmental protection interests, which are public interests, are underrepresented in the Leading Committee and its working groups, while economic and private sector interests tend to prevail, due to the numerous farmers’ and producer interests among the membership (EKO 2013).

The mechanism for monitoring the implementation of the ERDP, 2007–2013 and the achievement of its objectives is the **ERDP Monitoring Committee**. It was established by the Ministry of Agriculture as a permanent committee to review the draft regulations on agricultural support measures, make recommendations on amending regulations and evaluate the annual monitoring report. The Committee meets two or three times a year, meantime information on regulations is shared electronically among the members of the Committee. The Committee is made up of representatives of different ministries, the Agricultural Registers and Information Board, associations of agricultural

producers and farmers, food quality and agricultural production sector associations and organizations, forest owners' associations, educational and training institutions, environmental NGOs, rural tourism associations, the village movement, and social groups' associations (Estonian Rural Development Plan, 2007–2013).

8.4 Overview of key policies and strategies

▪ *Cross-sectoral water use and protection*

The Estonian National Strategy on Sustainable Development, *Sustainable Estonia 21*, defines ecological balance as one of its goals: using natural resources in ways and quantities that ensure ecological balance, reducing pollution and preservation of biological diversity and natural areas.

The *Estonian Environmental Strategy 2030* defines long-term goals, indicators and measures for the protection and sustainable use of water. The goals are: to use natural resources sustainably; to achieve a good status for surface water, including coastal water, and maintain bodies of water in good condition; to maintain or improve the status of groundwater, reducing the number of times that the limits for nitrates, plant protection products and other hazardous substances are exceeded; and to ensure the existence of the habitats and biotic communities necessary for the preservation of viable populations of species. The *National Environmental Action Plan* is the implementation plan of the Strategy. The current action plan is for the period 2007–2013.

The *National Spatial Plan "Estonia 2030+"* guides spatial development in both land and marine areas. In October 2012, the Estonian Government initiated marine spatial planning in pilot sea areas that border Pärnu and Hiiu counties in West Estonia up to the border of territorial waters.⁷⁶ The aim is to reach joint agreement on the division of human activities at sea and ensure the protection of marine ecosystems. Estonia's Maritime Policy, 2012–2020 states that spatial plans must be prepared for all Estonian sea areas by 2020.

The main instrument for implementing water policies are the *Water Act 1994* and related legislation. The Water Act provides general principles for water use and regulates water protection. It is also the main act through which the EU WFD (2000/60/EC), the Nitrate Directive (91/676/EEC) and the Marine Strategy Framework Directive (2008/56/EC) have been transposed into Estonian law. *Water Management Plans* have been developed for all three river basin districts and eight sub-river basin districts based on the WFD and the Water Act. The aim of the plans is to define water protection and water use measures at the river basin and sub-river basin district levels.

Estonia has ratified the *Convention on the Protection of the Marine Environment of the Baltic Sea Area*, 1992, which regulates Estonia's obligations in marine environment protection. The Helsinki Commission (HELCOM) *Baltic Sea Action Plan* (BSAP), 2007, aims to restore the good ecological status of the Baltic marine environment by 2021. The Estonian Implementation Plan for the Baltic Sea Action Plan 2008–2011 was approved by Estonian Government in 2008. A new implementation plan is being prepared.

The *Nature Conservation Development Plan 2020* foresees that ecosystem services assessments will have been carried out throughout Estonia by 2018. This work has not started yet. The Plan also

⁷⁶ Order of the Government of the Estonian Republic, no. 441 of 11 October 2012, https://www.siseministeerium.ee/public/2012-10-11_VV_algatamise_korraldus.pdf

addresses the negative environmental impacts of hydropower production on Estonian rivers, which are not generally suitable for this kind of energy production.

The *Estonian Marine Strategy*, based on the Marine Framework Strategy Directive, is under development and will form the environmental pillar of Estonian maritime policy. Its compilation is being led by the Ministry of the Environment, and the initial assessment was completed at the end of 2012. The goal is to achieve or preserve good environmental status for all Estonian marine waters by 2020.

- *Significant water-using sectors*

The oil-shale energy sector in Estonia is highly water-intensive. The relevant national level strategies on the energy sector are the *National Development Plans for the Estonian Energy Sector and Electricity Sector* and the *National Action Plan for Renewable Energy*. The National Energy Strategy is currently being updated.

The *Estonian Maritime Policy, 2012–2020* sets the direction for maritime affairs as a sector of the economy. The issues addressed include ports and port services, passenger and freight transport by sea and navigable inland waters, shipbuilding, fisheries, tourism, sea rescue, spatial planning for marine areas, e.g. for wind energy parks, submarine cables and other marine infrastructure, and maritime education and the protection of maritime heritage. An operational programme for the Policy is currently in development.

Sea and inland water transport, including ice roads in winter, are addressed in the *National Transport Development Plan, 2006–2013*. A new Transport Development Plan for 2014–2020 is being drafted by the Estonian Ministry of Economic Affairs and Communications.

In agriculture, *Estonian Rural Development Plan 2007–2013* lists the assurance of water quality as one of the main objectives under priority Axis II. A new Rural Development Plan for 2014–2020 is being drafted and there will be a specific set of measures on the environment that address water and biodiversity protection. **Nitrate Vulnerable Zone action plans** have been developed for *Pandivere and Adavere-Põltsamaa area*. As of March 2013, an action plan to 2015 was in preparation. A *Code of Good Agricultural Practice* (2006) summarizes measures on water pollution prevention and mitigation. A separate chapter is devoted to the nitrate vulnerable zone. Land improvement and the forest industry have an influence on water bodies. According to the RBMPs, *management plans for land improvement systems* have been developed for seven sub-river basin districts and the three river basin districts.

The general objective of the *Estonian Fisheries Strategy, 2007–2013* is to develop the Estonian fisheries sector as a part of the economy and to increase the competitiveness of fishery products in domestic and external markets, thereby contributing to the creation of a favourable and balanced fisheries environment in Estonia. The responsible ministry is the Ministry of Agriculture. There is also a *Recreational Fisheries Development Plan, 2009–2013*, developed by the Ministry of the Environment. The strategic aim of the development plan is to popularize, simplify and diversify recreational fisheries as a healthy leisure pursuit and the sustainable use of fish resources, and thereby to increase the number of people engaged in recreational fisheries to 100 000 by 2018.

The government is currently drafting a new bio-economy strategy for 2014–2030, which among other sectors will cover fisheries and aquaculture.

- *Settlements*

Drinking water is one of the areas covered by the *National Health Plan, 2009–2020*, which lists indicators of progress in achieving “a living, working and learning environment to support health” as a strategic objective. Among these indicators is “the percentage of the population supplied with drinking water that conforms to requirements”.

According to the Public Water Supply and Sewerage Act (1999), local government must organize the preparation of 12-year **public water supply and sewerage development plans**, which must be consistent with the sub-river basin management plans. In June 2012 Tallinn adopted a Storm Water Strategy to 2030. The Estonian Water Works Association has set themselves a strategic task to develop with the Ministry of the Environment a **water management strategy for Estonia** by 2016 (EVEL 2012).

8.5 Experience of policy implementation

- *River basin management*

The RBMPs have legal effect in the sense that they complement the regulation set out in the Water Act. All relevant facts and interests must be taken into account when exercising discretion e.g. by granting a permit (WRc 2012). The MoE is responsible for the preparation of RBMPs and the Programmes of Measures, which are carried out in open proceedings in each river basin district before they are approved by the central government.

A bottom-up approach was taken to planning water protection and use measures: first **sub-river basin management plans** were developed in open proceedings, coordinated by water specialists in the county environment departments. The plans were approved by Minister of the Environment in 2005–2008. They include Programmes of Measures that prioritize achieving good environmental status for water bodies. The RBMPs were based on these plans, because the initial aim had been to implement the RBMPs on the basis of the more detailed Programmes of Measures in the sub-river basin management plans. There are currently no plans in the MoE to update the sub-river basin management plans, since reporting on the implementation of the WFD is based on the river basin level.

Actions Plan for the Implementation of the Programmes of Measures were developed for each river basin in 2012, but have not yet been approved by Minister of the Environment. The development process was led by the Environmental Board, and the RBMP working groups were also involved. Measures were determined for the water bodies where it is necessary to restrict or prevent the use of water in order to improve its ecological status. These restrictions are taken into account by the Environmental Board when granting a water permit.⁷⁷ Local government have given their input into the RBMPs by providing information on the status of water bodies and of the proposed measures.

The process of updating the RBMPs began in 2012. **Flood risk management plans** will be prepared together with the RBMPs and the Programmes of Measures. The Water Act requires state authorities and local government to develop maps of and risk management plans for flood risk areas, which must be regularly updated and communicated. Flood hazard maps and flood risk maps need to be developed by December 2013, and flood risk management plans by December 2015. The updated

⁷⁷ Interview with Environmental Board representative

RBMPs will also have to address climate change issues. Floods are mentioned in a number of places in the current RBMPs (EC 2012).

As is noted above, the Koiva/Gauja river basin is shared with Latvia. Both countries have developed a management plan to cover their part of the district but there is no transboundary management plan. Preparation has begun on a joint river basin management plan co-funded by the European Regional Development Fund through the Cross-border Cooperation Programme between Estonia and Latvia, 2007–2013.⁷⁸

Community-based planning and voluntary forms of cooperation on river basin management are not yet widespread. Local government could develop integrated plans that look beyond the maintenance of beaches and the recreational value of their water bodies. These plans should address water bodies in a holistic manner, and set out the responsibilities and requirements of farmers and other stakeholders, as well as expectations of local people. The state could support the implementation of such plans.⁷⁹ Academics have expressed a wish to involve more water scientists and researchers in decision-making on large-scale funding allocations.⁸⁰

- *Integration of agriculture and water policy*

The main instruments for achieving environmental targets in agriculture are the Axis II measures in the ERDP. Agri-environmental support receives the largest share of Axis II funds: 63% of intended support payments in 2007–2013 (Poltimäe and Peterson 2010). Sall et al. (2012) identify a risk that improving competitiveness and supporting more intensive farming through the first pillar of the CAP and Axis I of the ERDP could increase water pollution and have a negative effect on water quality. For example, the increasing nitrate concentration in groundwater in the recent years can be correlated with increased use of fertilizers and the growing incomes of farmers.

In 2003, the Estonian Government designated⁸¹ an area of karst and springs in Central Estonia a **nitrate vulnerable zone (NVZ)** to protect ground and surface water, mainly from agricultural pollution. Special and stricter environmental regulations apply in this area, imposed by the Water Act and secondary legislation. The Pandivere and Adavere-Põltsamaa NVZ covers 326 712 ha, about 7% of Estonian territory. The Pandivere Upland is an important groundwater area for the whole of Estonia – the Pandivere State Water Protection Area was established there in 1988. However, the most fertile soils in Estonia are also located there, which has led to the use of intensive agriculture. Its easily soluble, fissured and porous rocks, however, mean that groundwater is poorly protected from surface water pollution.

It was originally planned to create special ERDP measures for farmers in the NVZ, but this idea was abandoned and the requirements were instead integrated into agri-environmental measures, which are stricter than the general requirements for farmers in the rest of the country (Poltimäe and Peterson 2010). Agriculture is supervised by the Environmental Inspectorate, but it is methodologically difficult to monitor whether restrictions on fertilizer application are being

⁷⁸ <http://www.bef.ee/index.php?id=848>

⁷⁹ *Interviews with ministry officials*

⁸⁰ *Interview with representative of academia*

⁸¹ *Regulation of the Government of the Estonian Republic no. 17 of 21 January, 2003*

followed.⁸² Training for farmers and agricultural support advisers on the regulations and their implementation is important to ensure good water quality.

More effort is needed to control diffuse pollution caused by fertilizers and animal rearing across Estonia, where most attention has so far been paid to the control of point source pollution. At the same time, there are conflicting data on agricultural diffuse pollution. The Ministry of Agriculture uses one methodology and the Ministry of the Environment another, and consultants may have their own data. A single methodology for measuring agricultural diffuse pollution agreed across the EU, like there is for pan-European air emission models, would be helpful.⁸³

An analysis of the role of RBMPs in limiting diffuse pollution from agriculture (Sall et al. 2012) found a lack of coordinated or concerted action towards the common goal of achieving a good water status by 2015. In addition, the RBMPs do not set annual targets for nutrient quantities based on HELCOM's annual reduction target levels for Estonia (of 220 tonnes of phosphorus and 900 tonnes of nitrogen), even though most of the measures limiting nutrient pollution are included in point source and diffuse pollution reduction topics in the Programmes of Measures.

It became clear from the interviews that cross-sectoral collaboration would be facilitated by a more detailed description in the legislation of the requirements for cooperation. Voluntary forms of cooperation have not become common or widespread.

- *Monitoring*

The **Estonian National Environmental Monitoring Programme** was established in 1994. There are three programmes on water monitoring at the state level: groundwater (seven sub-programmes), inland water bodies (11 sub-programmes) and the marine environment (six sub-programmes). The annual budget and the agencies carrying out the sub-programmes are approved by the Minister of the Environment based on the recommendations of the Monitoring Council. Not all the sub-programmes are monitored every year. The agencies are mainly research institutes, MoE agencies, non-profit organisations and state commercial enterprises.

A specific monitoring programme is in place for the NVZ in Pandivere and Adavere-Põltsamaa region, where surface water bodies have been continuously monitored for chemical substances since 1992 and groundwater has been monitored in Pandivere since the second half of the 1980s (Ministry of the Environment 2005). Monitoring activities in the NVZ are regulated by the NVZ Action Plan. The nationally led monitoring scheme covers 10 locations in the NVZ, measuring nitrate concentrations in wells, streams and rivers.

The European Commission's working document on the implementation of the WFD in Estonia (SWD(2012) 379 final) identifies the relatively weak chemical monitoring of water bodies and low density of monitoring stations as a major gap across all river basin districts. The monitoring programme has not provided sufficient data to enable status assessments of water bodies. The Estonian Ministry of the Environment argues that the main reason for this low density is the lack of evidence for this type of pollution or the sources of such pollution (EC 2012).

Nevertheless, lack of good data is one of the problems addressed in a Ministry of the Environment proposal to the EEA Financial Mechanism on integrated marine and inland water management. The

⁸² *Interview with ministry official*

⁸³ *Interview with ministry official*

aim is to further develop the water information system in order to be able to predict the status of each water body, and what happens if the load to the water body increases or reduces. Other planned activities in the proposal include establishing environmental targets and management plans for marine and inland waters, increasing awareness of and education on integrated marine and inland water management, and developing strategies and measures for adapting to climate change.

An issue under discussion in storm water management is the methodology for calculating the charge for storm water drainage if storm water is conducted to separate municipal storm sewer systems. At present there are no common principles at the state level, but these would be needed by local governments. Difficulties include the amount of precipitation to be taken into account if there is no meteorological station in a municipality and calculating the area of permeable surface.⁸⁴

8.6 Key innovations for cross sectoral integration

To bring the municipalities' water management infrastructure into conformity with EU Directives on Urban Waste Water and Drinking Water and be able to apply for support from the EU Cohesion Fund, the MoE initiated and local governments implemented regional water undertakings in 2004. Setting up and expanding these large-scale projects in Estonia was only possible with the cooperation of many institutions and companies. Municipalities grouped themselves according to river basin and jointly appointed one common water company to provide public water supply and sewerage services in the basin area. This allowed the establishment of a single, unified water price for the whole service area (Lääne and Reisner 2011). Regional water undertakings are also responsible for the sustainable management of the water infrastructure. According to the Ministry of the Environment, Estonia introduced schemes in which uniform local governments-owned water undertakings implement grouped projects to the European Union. The need for cooperation between water undertakings is increasing and these schemes are a good example. From the viewpoint of local governments there have been, however, also some concerns over possible increase of price for consumers in areas where so far the municipality provided the water service.

The Environmental Investment Centre (EIC) was named in the interviews as a strong instrument and successful development which has contributed significantly to improving water quality and infrastructure in Estonia. Investments in water management have made up the largest proportion of total EIC investment. However, whether all the substantive objectives on water protection and water quality have been achieved needs to be analysed as a part of the ongoing RBMP processes.

⁸⁴ *Interview with local authority representative*

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Annex 1 People interviewed

Spain

1. Official, Regional state authority
2. Researcher, University
3. Researcher, University
4. Researcher, Research Institute
5. Official, Regional Autonomous Agency
6. Researcher, Socio-economic NGO
7. Researcher, Environmental NGO
8. National state authority

UK

1. Official, national government agency
2. Official, national government agency
3. Researcher, non-governmental research institute
4. Researcher, university
5. Officer, non-governmental association
6. Officer, private water company
7. Officer, private water company
8. Independent consultant, local level
9. Officer, national (independent) government agency (in writing)
10. Officer, national government agency (in writing)

Finland

1. Markku Maunula, Sirkka Tattari and Markku Puupponen, Finnish Environment Institute
2. Mauri Karonen, Uusimaa ELY Centre
3. Jukka Koski-Vähälä, Union of Finnish Water Protection Associations
4. Tuula Hämäläinen-Tyynilä, Kari Kavasto and Ilppo Kajaste, Espoo Environment Centre, City of Espoo
5. Heikki Mäkinen, Vesijärvi Foundation
6. Jukka Piekkari, Helsinki Region Environmental Services HSY (Association of Municipalities)

Estonia

1. Official, national government agency
2. Official, national government agency
3. Official, regional authority (county government)
4. Official, national government agency
5. Officer, non-governmental organisation
6. Official, national government agency
7. Official, national government agency
8. Official, national government agency
9. Official, local authority (city government)
10. Researcher, university

Annex 2. Overview of relevant international and EU policies and agreements

International

The Ramsar Convention (1971)

Aim: the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world

Implementation: A contracting party is supposed to have at least one Ramsar site, promote consideration of wetlands in their land use planning, cooperate internationally, establish nature reserves in wetlands as well as promote training in wetland research, management and wardening.

Timeframe: Triennial national reports to the COP

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972)

Aim: To control marine pollution including, dumping from vessels, aircraft and platforms, and to promote regional cooperation.

Implementation: Assessing the needs and impacts of dumping, developing guidelines for impact assessment for different substances.

UN Convention on the law of the sea (1982)

Aim: To create a comprehensive set of rules to govern the oceans. "The Law of the Sea Treaty calls for technology transfers from developed to undeveloped nations. It also requires parties to adopt regulations and laws to control pollution of the marine environment."

(<http://www.unlawoftheseatreaty.org/>)

Implementation: National regulatory and legal framework. Demarcate national jurisdiction into the seas.

Timeframe: Continuous legal framework.

The Rio Declaration on Environment and Development (1992)

Aim: To guide sustainable development around the globe - man is central and has a right to a healthy and productive life in harmony with nature.

Implementation: Voluntary basis

(http://sustainabledevelopment.un.org/content/documents/641Synthesis_report_Web.pdf).

Agenda 21 (1992)

Aim: A global programme of action for sustainable development with a comprehensive blueprint for action to be taken globally. Protection of the oceans and protection of freshwater is of specific relevance.

Implementation: Voluntary basis.

http://sustainabledevelopment.un.org/content/documents/641Synthesis_report_Web.pdf).

The UN framework Convention on Climate Change (1992)

Aim: "Preventing "dangerous" human interference with the climate system is the ultimate aim of the UNFCCC" and "to cooperatively consider what they could do to limit average global temperature

increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable." (http://unfccc.int/essential_background/items/6031.php)

Implementation: the convention only encourages countries to reduce emissions.

The Kyoto Protocol (1997)

Implementation: Legally binds developed countries to the agreed emission reduction targets.

Timeframe: First commitment period 2008-2012. Second commitment period 2013-2020.

CBD (1993)

Aim: The conservation and sustainable use of biological diversity, as well as the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Implementation: National biodiversity strategies that integrates biodiversity considerations into all relevant sectors (eg. water), national reports on the implementation of the convention, cooperation and coordination with other institutions, conventions and processes.

Timeframe: Fifth national report by 2014, Strategic plan for biodiversity 2011- 2020, forms part of the goal "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people".

EU

CAP (1962) Common Agricultural Policy

Aim: To improve agricultural productivity for food-security, to make sure European farmers make a reasonable living, keep the countryside alive and preserve the rural way of life, adjust farming to climate change and secure food production at the same time as biodiversity is preserved. CAP and water: The CAP supports investments to conserve water, improve irrigation infrastructures and enable farmers to improve irrigation techniques. It also helps to protect water quality and promote ecosystem services.

Implementation: Rural development program and through direct farm support. Article 38 of the Rural Development Regulation will contribute to the implementation of the WFD.

Timeframe: Is currently linked to the EU 2020 strategy, and shall in line with that become more efficient and more competitive.

Common Fisheries Policy (1970)

Aim: achieve a thriving and sustainable European fishing industry through creating a common organisation of the market

Implementation: Regulations and guidelines, provide national authorities with the tools for enforcement, monitoring the size of the European fishing fleet, funding and technical support.

Aim of the reformed CFP: to provide EU citizens with a stable, secure and healthy food supply for the long term. It seeks to bring new prosperity to the fishing sector, end dependence on subsidies and create new opportunities for jobs and growth in coastal areas. At the same time, it fosters the industry's accountability for good stewardship of the seas.

Birds Directive (1979)

Aim: Cornerstone of Europe's nature conservation (operates through Natura 2000, SPAs, banning activities directly threatening to birds), creating a comprehensive scheme of protection for all wild bird species naturally occurring in the Union.

Implementation: bans activities that directly threaten birds, establishment of Special Protection Areas (SPAs). Since 1994 all SPAs form an integral part of the NATURA 2000 ecological network.

Bathing Water Directive (2006 - replaces the directive from 1976)

Aim: to preserve, protect and improve the quality of the environment and to protect human health.

Implementation: monitor waters, and provide information on quality to the EU. Member States should also prepare a description of bathing waters and the potential impacts and threats to water quality.

Timeframe: Each member should monitor their water during the bathing season, and submit a report on the state of their bathing water to the EC each year before the bathing season. All water should have reached the quality sufficient by 2015.

Drinking Water Directive (1998) [1980]

Aim: To protect the health of the consumers in the European Union and to make sure the water is wholesome and clean.

Implementation: sets quality standards for drinking water on the tap and obliges member states to regular monitoring of drinking water and provide consumers with information on their drinking water quality.

Timeframe: Report every third year to the EC, should already be transposed into national legislation.

Groundwater Daughter Directive (2006) [Groundwater Directive 1980]

Aim: to prevent and combat groundwater pollution

Implementation: To set criteria for assessing the chemical status of groundwater and trends of groundwater pollution levels. To set criteria for the starting points for reversing these trends, preventing and limiting indirect discharges of pollutants into groundwater (these are supposed to be drawn up in the River basin management plans under the WFD).

Timeframe: Closely connected to the WFD as a "daughter directive" (the WFD said that measures would be taken on groundwater pollution, and this directive outlines those measures)

Sewage Sludge Directive (1986)

Aim: to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man.

Implementation: it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil, and regulates the usage of treated sludge. It specifies rules for the sampling and analysis of sludge and soils, and sets limit values for concentration of heavy metals in the soil.

Timeframe: Five years after notification of the directive and then every four years: produce a consolidated report on the use of sludge in agriculture and forward it to the EC

Regional Policy/cohesion policy (1986)

Aim: to strengthen the economic, social and territorial cohesion of the Union.

Implementation: Mainly financial measures through the cohesion fund and the structural funds. Important funding mechanism for water related projects.

Timeframe: Have had several phases, the current regional funding programme is running 2007-2013. The next will run 2014-2020 (EU Cohesion fund 2014-2020) and be linked to the EU 2020 strategy

EU Strategy for the Baltic Sea Region (2009)

Aim: Strives for more intensive cooperation between the Baltic countries and shapes the region into a regional cooperation model for the whole EU. The strategy aims to save the sea, connect the region and increase prosperity.

Implementation: To mobilise all relevant EU funding (through the EU regional policy and other EU funding mechanisms as well as international financial institutions) for bringing together initiatives in different sectors, promote cooperation among stakeholders as well as promoting Flagship projects.

Nitrates Directive (1991)

Aim: protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices

Implementation: Identification of water that could be or is polluted, designate Nitrate Vulnerable Zones and establishment of compulsory action programmes for these areas, establish codes of good agricultural practice to be implemented on voluntary basis by farmers, national monitoring and reporting.

Timeframe: Reporting every fourth year

Urban Waste Water Directive (1991)

Aim: to protect the environment from discharges from urban waste water and from certain industrial sectors

Implementation: Designate sensitive areas and establish a financial and technical programme for construction of wastewater collection and treatment systems, regulation of wastewater, monitoring, and information and reporting with obligations towards other member states if the wastewater is transboundary, the EC and the public.

Timeframe: Most deadlines have already been passed, review of the sensitive areas and their catchment every fourth year, and updating implementation programme every second year.

Habitats Directive (1992)

Aim: Cornerstone of Europe's nature conservation (operates through Natura 2000 and strict species protection)

Implementation: builds on the Natura 2000 network and a strict systems of species protection

Natura 2000

Aim: EU-wide network of nature protection areas established under the 1992 Habitats Directive. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is comprised of Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive, and also incorporates Special Protection Areas (SPAs) which they designate under the 1979 Birds Directive.

IPPC (2008) [1996]

Aim: minimising pollution from various industrial sources throughout the European Union.

Timeline: To be replaced 7 of January 2014 by the Directive of Industrial Emissions

WFD (2000)

Aim: to achieve good status of all waters (including surface water and ground water), and ensuring that human use of water is compatible with the environment's own need for water to protect ecosystems

Implementation: Updates on national water status based on river basin management plans and reporting. Transposition of directive into national legislation

Timeframe: 2015: meet environmental objectives; first management cycle ends; second river basin management plan and flood risk management plan. 2021: Second management cycle ends. 2027: Third management cycle ends; final deadline to reach targets.

Replaces by 22 of December:

- Shellfish Water Directive (2006) [first version 1979]
- Freshwater Fish Directive (2006) [first version 1978]

Horizon 2020 Initiative (includes non-EU members) (2006)

Aim: Financial instrument to implement the new programme for research and innovation.

Integrated Maritime Policy (2007)

Aim: seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas.

Implementation: encourage authorities to share data across policy fields, build up close cooperation between decision-makers in the different sectors at all levels of government, it has cross-cutting policies within blue growth, marine data and knowledge, maritime spatial planning, integrated maritime surveillance, sea basin strategies. Marine Strategy Framework Directive is the environment pillar of the policy. And the A marine and maritime agenda for growth and jobs policy is envisioned to ensure growth and employment.

A marine and maritime agenda for growth and jobs (the Limassol Declaration) (2012)

Aim: creating growth and jobs in the marine and maritime sectors

Implementation: Focuses on 5 main sectors: marine renewable energy, aquaculture, blue biotechnology, coastal tourism and sea bed mining.

Marine Strategy Framework Directive (2008)

Aim: to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend.

Implementation: Investigate status of marine waters, decide what GES means in the country, decide targets and indicators to achieve GES, Develop marine strategies (in cooperation with other countries if sharing marine waters)

Timeframe: Programme to achieve GES to 2020 by 2015, review of marine strategies every sixth year.

Floods Directive (2007)

Aim: reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity

Implementation: requires Member States to assess if (all) water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. The Directive also reinforces the rights of the public to access this information and to have a say in the planning process. It shall be carried out in coordination with the WFD.

Timeframe: 2011 - preliminary flood risk assessment, 2013 - flood hazard and flood risk maps, 2015 - flood risk management plans, then these steps need to be reviewed every sixth year in coordination with the WFD

REACH (2007)

Aim: to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances.

Implementation: Companies must identify and manage the risks linked to the substances they manufacture and market in the EU. Manufacturers and importers are required to gather information

on the properties of their chemical substances, and to register the information in a central database run by the European Chemicals Agency (ECHA) in Helsinki.

Timeframe: The regulation will be phased in during an 11-year period. 2013 - review the scope of the regulation, 2019 review if there should be an extension on the obligation to report a Chemical Safety Report.

White paper on adapting to climate change (2009)

Aim: framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change

Implementation: Current info is old and states that they are finding the best avenues for the adaptation phase - is the water blueprint the implementation?

Timeframe: First phase 2009-2012 lays ground for comprehensive adaptation strategy to be implemented during phase 2, 2013 onwards

Europe 2020 (2010)

Aim: To make EU a smart, sustainable and inclusive economy

Implementation: Objectives on employment, innovation, education, social inclusion and climate/energy. Flagship initiatives: including, resource-efficient Europe, which in turn guides policy revision to CAP, the outline of a Resource Efficiency roadmap etc.

Timeframe: guiding policy development up to 2020.

EU Resource Efficiency Roadmap (2011)

Aim: to transform Europe's economy to a sustainable one (resource efficient and decoupled)

Implementation: proposing ways to increase resource productivity, decouple economic growth from resource use and environmental impacts, as well as illustrate how policies interrelate and build upon each other.

Timeframe: Vision for structural and technological change by 2050, milestones to be reached by 2020.

EU 2020 Biodiversity Strategy (2011)

Aim: Halt the loss of biodiversity and ecosystem services by 2020

Implementation: 6 targets and 20 actions, stresses the need to integrate biodiversity concerns into all EU and national sectoral policies (especially CAP and Common fisheries policy)

Timeframe: Meet headline target by 2020 (see aim) and overarching vision by 2050

EIA Directive (2011)

Aim: ensures that the environmental implications of decisions are taken into account before the decisions are made.

Water blueprint (2012)

Aim: The Blueprint is expected to help to better integrate water objectives into other EU policies, and to achieve good status for water ecosystems and water related biodiversity while also encouraging water efficiency

Implementation: outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular regarding water quantity and efficiency.

Timeframe: Closely related to EU's 2020 Strategy and resource efficiency roadmap timeframe, but analysis based on a 2050 timeframe and it is expected to guide EU water policy in the long term

European Innovation Partnership on Water

Aim: To stimulate creative and innovative solutions that contribute significantly to tackling water challenges at the European and global level, while stimulating sustainable economic growth and job creation.

Implementation: Identify, test, scale up, disseminate and stimulate the uptake of innovative solutions by the market and society for 10 major water related challenges. Current tools: annual EIP Water meeting, Web based market place and more tools are under development.

Timeframe: 2020 for their headline target

EWP European Water Partnership

Aim: to initiate, support and enforce all actions and projects that will help to achieve the objectives of the Water Vision for Europe.

Implementation: to provide an open and independent forum, mobilise funding, stimulate and support cooperation, put water on the political and media agenda,

Timeframe: Vision for 2030

Regional

Convention on the Protection of the Marine Environment of the Baltic Sea Area (1992)

Aim: to prevent and control pollution of trans-boundary watercourses and international lakes by developing international cooperation

Implementation: The Contracting Parties shall individually or jointly take all appropriate legislative, administrative or other relevant measures to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance. Members must apply the precautionary and polluter pays principles, and they shall promote the use of Best Environmental Practice or Best Available Technology. They shall also use "their best endeavours" to ensure that the implementation of the convention doesn't cause pollution elsewhere.

Baltic Sea Action Plan (2007)

Aim: Towards a Baltic Sea unaffected by eutrophication, with life undisturbed by hazardous substances, a favourable conservation status of the biodiversity, and maritime activities carried out in an environmental friendly way

Implementation: Commitments to reach the goals - each contracting party finds its own implementation strategy?

Timeframe: National implementation strategies 2010, evaluation of the strategies 2013, eutrophication measures taken by 2016,

The Oskar Convention (1992)

Aim: Prevent and eliminate pollution from land-based sources, dumping and offshore sources, and to assess the quality of the marine environment, in the North-East Atlantic