

# Water planning and management after the EU Water Framework Directive

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**ABSTRACT:** This chapter provides an overview of the different legal, administrative and economic factors that provide the institutional context for water management in Spain, focusing on the effects of the 2000 European Water Framework Directive (WFD). At present and partially due to the WFD implementation process, the Spanish water sector is experiencing a slow transition from old to new water paradigms. Highlights in this sense are the consideration of the achievement of ecological quality as a primary planning and management objective; an increase in public participation and transparency in water-related decision processes; the economic analysis of water services; and an increased emphasis on water demand management. The achievement of the WFD objectives faces several challenges and uncertainties that are of technical, financial and political nature. However, possibly the key to a successful implementation of the WFD and a real shift of paradigm lays in strengthening the link between land use and water management and in creating institutional structures that facilitate co-responsibility and full cooperation between the central state and the regions, who hold most of the responsibilities on land use management.

**Keywords:** water policy, Water Framework Directive, water paradigm, IWRM, assessment

## I INTRODUCTION

The start of the 21st century has brought about significant changes in water policy and management in Spain. These include the approval of several new pieces of water-related legislation, the resulting reform of river basin planning procedures, and a progressive decentralization of water management. The latter in turn has led to the creation of new regional river basin authorities and changes in the distribution of functions and authority on water planning and management between the central and regional governments. This chapter provides an overview of the different factors that provide the institutional context for water management in Spain, focusing on the effects of the European Union's Water Framework Directive (WFD, *Directive 2000/60/EC*) approved in 2000 and transposed into Spanish legislation in December 2003.

## 2 LEGAL, ADMINISTRATIVE AND ECONOMIC FACTORS

While it is not the objective of this chapter to make a comprehensive analysis of all the elements that influence current Spanish water policy, it is worth highlighting some of the main legal, administrative and economic changes that have taken place during the past decade and define Spain's water management framework today.

In the legal sphere, the European Union (EU) has approved a number of new Directives that have important implications. First among them is the WFD, which represents the main focus of this chapter and will be further discussed in the next pages. Other relevant EU Directives are the Directive on the Protection of Groundwater Against Pollution and Deterioration (2006/118/EC), the Dangerous Substances Directive (2006/11/EC), the Environmental Quality Standards Directive (2008/105/EC) and the Directive on Integrated Pollution Prevention and Control (2008/1/EC), all of which set strict qualitative requirements and management standards for both ground and surface waters. The Directive on Public Access to Environmental Information (Directive 2003/4/EC) adapts European legislation to the requirements of the Aarhus Convention (Convention on access to information, public participation in decision-making and access to justice in environmental matters) and reinforces the WFD requirements in relation to public participation (see Chapter 17). Additionally, during the past decade, Spain has made significant progress in compliance with two Directives approved in the 1990s that have great influence on the status of water bodies: the Wastewater Treatment Directive (91/271/EEC) and the Directive for Protection of Waters against Pollution caused by Nitrates from Agricultural Sources (91/676/EEC).

At the national level, the Spanish National Hydrological Plan (NHP) (Law 10/2001) – a crucial element in pre-WFD Spanish water law – and its subsequent amendments (Royal Decree 2/2004 and Law 11/2005), dominated Spanish water policy debates in the first half of the decade. The key element of this plan was the highly disputed Ebro water transfer scheme, a 914 km long transfer of 1,000 hm<sup>3</sup>/year [hm<sup>3</sup> = cubic hectometre = million m<sup>3</sup> = 10<sup>6</sup> m<sup>3</sup>] from the lower Ebro river in the north-east of Spain to the different provinces along the Mediterranean coast. The abrogation of this project by Royal Decree (RD 2/2004) marked a milestone in Spanish water policy for several reasons. First, it meant a rupture with the long-standing discourse of *hydro-solidarity* among *water abundant* and *water scarce* regions, and a clear example of the use of water as a political weapon.<sup>1</sup> Second, in the Mediterranean regions it implied a shift of the emphasis from reservoirs and transfer schemes to desalination plants as a means of augmenting water supply.<sup>2</sup> Third, it emphasized (at least on paper) demand

1 The donor and recipient areas of the transfer were of opposite political colour and the abrogation or continuation of the transfer was a political flag during the 2004 national elections campaign. The abrogation of the project was the second major act by the newly elected Government, after the withdrawal of Spanish troops from Iraq.

2 The AGUA Program (Actions for Water Management and Use), approved in 2005, emphasized the construction of desalination plants along the Mediterranean coast to substitute the water that the Ebro transfer would have contributed. The planned desalination capacity amounted to over 700 hm<sup>3</sup>/year. Today many of the planned plants are operational, and desalinated water is heavily subsidized to make it affordable for farmers. However, plants are dramatically underused (only operational at 20% capacity for the most part), and farmers continue to rely on regulated or unregulated groundwater resources, aggravating the situation of many intensively used aquifers along the coast.

management approaches, boosted wastewater, recycling and reuse and, although timidly, increased the focus on water governance issues.

The NHP Law also improved drought management practices requiring the elaboration of normative Drought Management Plans at the river basin level and Drought Emergency Plans for cities of over 20,000 inhabitants. These plans imply a shift from reactive responses to cyclical droughts to proactive management approaches and are in line with the recommendations set out in the 2007 European Commission Communication on Water Scarcity and Droughts. Drought Management Plans were developed and approved in 2007 for all river basins. The NHP also included a specific requirement for the development of a Special Management Plan for the Upper Guadiana basin, a region where intensive (and often uncontrolled) groundwater development starting in the 1970s contributed to the degradation of protected groundwater-dependent wetland ecosystems. After much negotiation and debate, the Upper Guadiana Special Plan was approved by Royal Decree in 2008, representing a first attempt to tackle the problem of uncontrolled groundwater use in that region in a comprehensive and participatory way. It acknowledged that any viable answer to groundwater mismanagement required devising broadly acceptable solutions with the participation of the main water users (see Chapter 20).

In the administrative sphere, the advent of democracy in Spain in the 1970s brought with it political decentralization, with the transfer of authority over an increasing number of policy areas (education, healthcare, agriculture, environmental and land use policy, among many others) from the central government to autonomous regions.<sup>3</sup> This process also affects the management of water resources. The Spanish Constitution clearly establishes that inter-regional river basins, that is, those that cross more than one autonomous region, should be managed by the central government (through the River Basin Authorities or *Confederaciones Hidrográficas*), whereas river basins that flow entirely within an autonomous region should be managed by its autonomous government. However, the Spanish political landscape has significantly changed since the definition of that constitutional rule, and regions have looked for legal means to increase their role in water management in inter-regional basins. The highly emotional nature of decisions surrounding water and the use of water policy debates for political gain have made it difficult to reach satisfactory solutions in many cases (López-Gunn, 2009). The jurisdictional uncertainty originated by these territorial tensions has hampered river management and planning processes in some cases. For example, in 2007 management authority for the Guadalquivir river (90% of whose area is within the autonomous region of Andalusia), was transferred from the national to the Andalusian regional Government through emergency legislation. A constitutional challenge by the region of Extremadura (which has 6% of the basin within its borders) resulted in a 2011 ruling by the Spanish Constitutional Court to return management responsibilities to the central government. This has led to a prolonged transition period and the associated confusion among water users and River Basin Authority officers. In the Júcar river basin, a legal dispute among the two primary regions sharing the basin (Castilla-La Mancha and Valencia) over

3 The 1978 democratic constitution divided the country into 17 autonomous regions and 2 autonomous cities with varying, and increasing, degrees of autonomy.

the delimitation of the Júcar River Basin District, is preventing the publication of the draft basin management plan and therefore blocking the water planning process.

Given the preponderance of agriculture in the consumption of Spanish water resources, the evolution of agricultural policies has a significant impact on water management and use. Over the past decade there have been significant changes in the EU Common Agricultural Policy (CAP) with an increased emphasis on environmental conditionality and the progressive decoupling of subsidies from production. These changes have brought about a decrease in the production of water-intensive crops that benefited from subsidies in the pre-2003 CAP scheme. For instance, between 2004 and 2006 the surface dedicated to irrigated corn in Spain has decreased by 22%, and for legumes has decreased by 33%, while the surface of less water-intensive crops like winter cereals, vineyards and olive trees has increased between 13 and 18% (Garrido & Varela-Ortega, 2008).

Agricultural policies have also experienced a significant evolution in Spain over the past decade. An increasing emphasis on improved efficiency of irrigation systems materialized in several regional agricultural modernization initiatives in the late 1990s and the early 21st century, and the approval in 2006 of a National Plan for Irrigation Modernization, funded with over 2,000 M€. Although the allocation of saved water to new irrigation uses is casting doubts about the effectiveness of these modernization plans in achieving their stated objectives (see Chapter 19), they have contributed to modify the irrigation dynamics in several areas of Spain.

The Spanish agricultural sector was also affected by the rise of cereal prices in 2008 and the price volatility that followed, reframing the concept of both EU and national food security and the strategic role of staple crop production (EC, 2010).

Finally, the context for water management in Spain should be analysed in light of the global economic recession triggered by the USA subprime mortgage crisis in 2008. The recession has deeply affected the Spanish economy, with significant implications for water management. Budgetary restrictions have dramatically reduced the public administrations' investment capacities. As a result, existing water-related plans and programmes are being revised and reduced. The draft Basin Management Plans' Programmes of Measures will have to be thoroughly reviewed to make them financially viable and will likely have a far more modest emphasis on new infrastructures for water resources development (dams, desalination plants, water transfers) and a greater emphasis on non-structural measures. Moreover, budgetary restrictions could imply a reduction in water-related investments such as the construction of urban wastewater treatment plants, which soon will no longer be backed by EU funds (see Chapter 13). On the other hand, the collapse of the economic growth model based on real estate development<sup>4</sup> is likely to decrease the pressure on water resources, especially in water-stressed Mediterranean regions where much of the tourism-related second home development was concentrated. While this pressure is not large in terms of overall quantity (relative to agricultural uses), it is significant because it is concentrated in space and time, placing a significant burden on municipalities and local environmental conditions.

4 Between 2007 and 2010 the number of new homes whose construction was started in Spain decreased by 80% (INE, 2011).

### 3 THE WATER FRAMEWORK DIRECTIVE: OPPORTUNITIES AND CHALLENGES

The Water Framework Directive set ambitious environmental objectives to EU Member States, who are required to achieve and maintain a good status of all their waters (surface and groundwater; transitional and coastal waters) by 2015, as well as to prevent any further deterioration of that status. According to the WFD, the achievement of these objectives will contribute to the “provision of the sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use, a significant reduction in pollution of groundwater, the protection of territorial and marine waters, and achieving the objectives of relevant international agreements ...” (WFD, Article 1).

A critical milestone in the implementation of the WFD is the approval of a River Basin Management Plan (RBMP) for each River Basin District (RBD). According to the official WFD calendar this should have occurred in December 2009, to allow for a 6-year implementation cycle until 2015. In Spain, work on the WFD implementation started in earnest in 2004 (Hernández-Mora *et al.*, 2011). The resulting RBMPs have to be approved by a governmental Royal Decree, thus having a normative value. However, by the spring of 2012 only the RBMP of the District of the Internal Catalan Basins had completed the approval process, while plans in most of the other RBDs were pending legal approval by the RBD’s consultation boards (*Consejos del Agua*) or by the Central Government. In a few cases – Tagus, Segura, and Júcar – the strenuous negotiation over some substantial aspects of the RBMP between the Central Spanish Government and the affected regions was still blocking the publication of the draft plans in May 2012. Consequences of this generalized delay are not only legal actions initiated by the EC against Spain (in 2010 and 2011), but also and more importantly that in most of the river basins the 6-year implementation process will be significantly reduced, thus curtailing the effectiveness of the RBMPs.

The adoption of the WFD implies moving past the water development and supply augmentation paradigms that were forged and successfully applied throughout the 20th century, when Spain needed to harness and use water in order to boost its socioeconomic development. The WFD has added new dimensions and challenges to Spain’s water policy, requiring that all water bodies achieve good status as a primary management goal. However, some authors have argued that a more substantial reform of water legislation goals and priorities would have been necessary to truly comply with WFD requirements (La Calle, 2008; Hernández-Mora *et al.*, 2011). The transposition of the WFD to Spanish legislation has resulted in the new goals and priorities being superposed to existing demand satisfaction objectives, without truly transforming water policy goals. The European Commission has supported this view and, in 2010, issued a reasoned opinion to the Kingdom of Spain for poor transposition of the WFD into the national legislation.

The WFD sets ambitious public participation requirements as an integral part of the water planning and management process. Prior to the WFD, Spain had a long tradition of user participation in water decision making through the representation of permitted users in the formal consultation bodies of River Basin Organisations (RBOs). Non-economic users or other interested parties, as well as the wider public, had limited access to decision-making processes and had difficulty making their voices

heard. The WFD requires RBOs to incorporate all stakeholders, including users, and the wider public in decisions over water, thus widening the circle of participation. In Spain, with a limited tradition in this wider concept of participation, this requirement is hampered by lack of expertise and means, as well as the need to overcome the institutional inertia of the established system (see Chapter 17).

The economic requirements set by the WFD have also posed a challenge. The Directive requires Member States to estimate the economic value of water uses, the cost of the associated water services, and how much of that cost is recovered from users, encouraging the use of water pricing as a tool to achieve an efficient use of water. When designing the Programme of Measures of the RBMPs, RBOs should apply cost-effectiveness analysis to the selection of measures to be implemented. In Spain, the debate on a new water pricing policy was addressed in the failed 2007 Water Act reform effort. The draft Water Act proposed reforming the existing economic and financial regime that applies to water uses. It set a groundwater use fee to cover groundwater management costs. In terms of surface water users, official reports stated that existing fees covered between 85 and 98% of all water service costs (MIMAM, 2007a). These figures, however, were questioned by some authors (Arrojo, 2008), who argued that existing water legislation limits the ability of the water administration to recover even the full financial cost of hydraulic infrastructures. In the case of groundwater, users cover well construction, maintenance and operational costs. But public management and control costs, environmental externalities, or the cost of corrective measures to mitigate the impact of these externalities are neither calculated nor, by consequence, recovered. The pricing reform met frontal resistance from irrigator associations and other stakeholder groups. The Water Act reform proposal did not make it out of congressional debates and was eventually abandoned.

Since the creation of the *Confederaciones Hidrográficas* or RBOs in Spain beginning in the 1920s, water has been managed using the river basin as the basic administrative unit. Hence, the WFD requirement that water should be managed according to River Basin District has not implied a radical transformation in the water management institutional setting as has occurred in other countries (see for instance Hedelin & Lindh, 2008). Nonetheless, the WFD has contributed to unsettling a model that from the outside seemed robust but which internally was strained, since it was designed to deal with objectives, challenges and social demands that greatly differ from current ones. The WFD requires a better integration of sectoral and water policies, and of continental and coastal water management. To facilitate this integration, the Spanish law that transposed the WFD created a coordinating body, the Committee of Competent Authorities, that includes representatives from different administrative levels (national, regional and local), as well as ports and coastal management. In a country where autonomous regions have powers over an ever increasing range of issues, their role in water policy and decision needs to be redesigned. Regional governments have claimed authority over water management with increasing vehemence over the past decade, thus increasing the strain on the current institutional model (for more on this point see Chapter 4). The reform of the current administrative model is complex and full of difficulties but clearly necessary, since it represents a bottleneck in the achievement of WFD objectives.

The WFD has also implied a tremendous effort in terms of collecting, organizing and analysing water-related data. Given the shift in policy and management priorities

from water development to ecological protection, information and control systems had to be adapted. Biological monitoring networks have been created where none existed before, and other monitoring and control networks have been reinforced and expanded to comply with WFD requirements. Just as an example, in the nine RBDs managed by the central government, the number of piezometers increased from 831 in 2002 to over 2,200 in 2009, with a total investment of over 65 M€ (Carceller, 2011).

The planning process has provided a vast amount of highly technical information and data, which has been made available to the public at the different planning stages. However this has not necessarily led to better understanding of planning goals or the water management process by stakeholders and laypeople. The scarcity of summary documents easily understandable for non-technical audiences, the sheer volume of information to be processed, and the difficulty in obtaining the background studies from which plans and proposals are developed, have made it hard for stakeholders and the general public to actively participate.

The evaluation of the economic value of water uses, the analysis of biological and hydrogeomorphological parameters, the identification and characterization of water bodies according to their ecological status, are all new planning requirements that have given rise to an intense methodological debate and have absorbed a good amount of resources. Moreover, the WFD requires working with new geographical management units (water bodies) different in both scale and definition criteria from those used in former water planning efforts in Spain.

#### 4 THE RESULTING SCENE: A SLOW SHIFT OF PARADIGMS?

Twelve years after the approval of the WFD, the Spanish water sector is experiencing a slow transition from old to new water paradigms. Progress towards the water management model prompted by the WFD and the so-called *New Water Culture* (Martínez Gil, 1997) is slowed by inertia (or active opposition) to change of traditional systems, by constraints in the human and social capital, and by the limited technical and financial resources to fully adapt to the WFD mandate (for a broader debate see Hernández-Mora *et al.*, 2011).

The new RBMPs drafted under the WFD guidelines, despite having weaknesses and gaps, represent a substantial progress relative to the RBMPs developed in the 1990s. Highlights in this regard are the consideration of the achievement of ecological quality as a primary planning and management objective; the increase in both public participation and transparency throughout the planning process; the economic analysis of water services; and the emphasis on water demand management as an effective measure to deal with situations of scarcity. Nonetheless, several unresolved issues remain, some of which are summarized in Table 1.

The achievement of good status for all waters within the established deadlines is surrounded by a high degree of uncertainty, due to a number of reasons. The first one is of a technical nature and is inherent to any programme aimed at improving the ecological status of a natural resource, as there is limited understanding of an ecosystem's response to the implementation of management measures. A second limitation derives from the fact that surface and groundwater bodies are physically interconnected.

Table 1 Elements of the transition from the old to the new water paradigm.

Progress towards the new water paradigm	Unresolved issues
More and better data on water availability, ecological status and water uses.	Lack of data overview, remaining information gaps for water bodies and certain types of data (e.g. hydro-geomorphological elements).
Inclusion of demand management measures (water markets, increased water efficiency).	Little debate on cost recovery and water pricing to achieve economic sustainability.
Acknowledgement of the need to set limits to the expansion of irrigated agriculture.	Need for a transparent and open debate on the role of agriculture in Spanish society and economy.
Boost to public participation.	The composition of formal participatory bodies does not reflect the WFD mandate (wider public, non-consumptive users).
Consideration of environmental objectives in the planning process.	Incomplete transposition of WFD into Spanish legislation (superposition of objectives and goals).
Acknowledgment of the need to act on land use drivers to improve water quality.	Difficult inter-administrative cooperation (between regional and national authorities, between different sectors).
Acknowledgement of the clear link between chemical and quantitative status.	Diffuse water pollution.
Definition of a standard approach to the establishment of in-stream flow regimes.	Opaque and limited in-stream flow regime negotiation processes further hampered by overallocation of existing resources in some river basins.

Source: Own elaboration.

Moreover, the good quantitative status of a water body is crucial to achieve its good qualitative status. As a result, the achievement of the WFD objectives requires a coordinated implementation of the measures on all the interconnected water bodies and addressing both quantitative and qualitative water problems. To this uncertainty, one must add that diffuse water pollution arising from agriculture is a complex and severe problem that cannot be tackled without changes in current farming practices (see Chapter 12). Thus, it also requires a strategic review of Spanish agricultural policy and cannot be solved exclusively through the RBMPs. In other words, a major WFD challenge is the achievement of an effective integrated land and water management and the high inter-administrative and inter-sectoral cooperation required for it.

A second level of uncertainty is related to the actual availability of financial resources to fund the measures defined in the RBMPs. In light of the economic recession and the resulting public spending cuts, it is very likely that each RBO will have to revise the Programmes of Measures to adapt them to the funds actually available. In this situation of uncertainty, it seems crucial to prioritize cost-effective measures that make the best use of limited resources. For instance, it may be worth critically evaluating whether the large amount of funds that are being allocated to the modernization of irrigation systems could be applied to alternative measures that would be potentially more effective in achieving WFD goals. Furthermore, in some RBDs the



water monitoring and control networks are being significantly curtailed as a result of budgetary restrictions (Iglesias, 2011), thus limiting the RBOs' capacity to adequately monitor the effectiveness of the WFD implementation.

A third level of uncertainty is related to the political will to implement non-technical measures that may encounter some degree of social opposition, such as strict control on water abstractions, the restriction or cancellation of water use permits in over-allocated basins, or the application of more ambitious cost recovery measures. In a context of economic crisis, the latter is closely related to the sustainability of the water management system itself. Low water prices that do not fully capture investment and management costs can lead to high deficit levels that cannot be sustained in the long term.

In several Spanish RBDs agriculture is the largest user of water and must therefore play a key role in achieving WFD objectives. The low profitability of much of Spanish continental agriculture (MIMAM, 2007b) together with the lack of generational replacement in the agricultural sector in many regions, pose a significant challenge to the future of agriculture in the context of global markets and increasing deregulation. Setting aside broader social and territorial considerations, these challenges may lead to a self-regulation of agricultural water use in some regions. It is strategically necessary to review the role of agriculture in the economy, in the conservation of biodiversity and in the functioning of rural society. The CAP reform for the 2014–2020 EU budget cycle is now under way and will probably put increased emphasis on the compatibility of agriculture and nature conservation objectives, including an increased integration with WFD goals (Henke *et al.*, 2011).

The tight link between water and land use puts the focus on the need to plan and make decisions from the perspective of integrated water and land use management. This requires finding new ways of constructive cooperation between water authorities and the administrative levels that are in charge of defining, funding and implementing most of the sectoral policies that determine land use. These are the autonomous regional governments, who in the current institutional setting of the interregional RBDs are not responsible – and thus not accountable – for WFD implementation. Possibly the key to a successful implementation of the WFD lays in strengthening the link between land and water management and in creating the institutional structures that facilitate co-responsibility and full cooperation between the central state and the autonomous regions.

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