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The Role of the Water Framework Directive in the Controversial Transition of Water Policy Paradigms in Spain and Portugal

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ABSTRACT: The process of drafting, approving and implementing the Water Framework Directive (WFD) has played a pivotal role in the water-related political agenda of the Iberian Peninsula. The WFD has provided an institutional impetus for a shift from the dominant hydraulic paradigm towards a new water governance approach. The new approach, known as the New Water Culture (NWC), predated the WFD. It was initiated in Spain and Portugal in the 1990s and has been promoted by a coalition of academics, social activists, and water managers. Given the long tradition and relevance of water debates in Spain and Portugal, the sociopolitical and territorial conflicts surrounding the implementation of the new regulatory framework are of particular significance. Legal debates about the (in)correct transposition of the WFD into Spanish and Portuguese legislation are still unresolved. Legal debates about the (in)correct transposition of the WFD into Spanish and Portuguese legislation are still unresolved. Controversies focus on issues such as the use of economic instruments, for instance cost recovery and the use of public subsidies (a key component of the hydraulic paradigm), as well as the role of public participation in decision making processes. Significant resistance has been mounted by the traditional water policy community, which continues to dominate power structures surrounding water. Throughout the long WFD implementation process, conflicting views and interests have consistently emerged with regard to the diagnosis and identification of existing pressures and the definition, evaluation and implementation of the proposed measures. Controversies have also emerged around the extensive use of exceptions which has allowed the hydraulic paradigm to persist over time. Progress towards the promised governance model, however, is taking place, with significant improvements in transparency, more accurate knowledge regarding the aquatic ecosystems services and the inclusion in water management agencies of more diverse experts including social scientists, biologists and geologists. This paper looks at the role the WFD implementation process is playing in the struggle for the transformation of water policy in Spain and Portugal. It examines this through the lens of the NWC movement.

KEYWORDS: WFD implementation, New Water Culture, Spain, Portugal, water governance, controversial transition

INTRODUCTION

The approval of Directive 2000/60/EC established a framework for community action in the field of water policy. The Water Framework Directive (WFD) held the promise of a fundamental change in water policy (Moss, 2008; Hering et al., 2010). It aimed to shift the emphasis from chemical water quality towards a more integrated approach where ecological criteria guided management and policy and where socio-economic and territorial considerations became integral components of water planning.

The process of drafting, approving and implementing the WFD has played a pivotal role in the water-related political agenda of Spain and Portugal. The WFD provided an institutional impetus for a shift away from the traditional hydraulic paradigm that had dominated the water policy of both Iberian countries throughout the 20th century (Sauri and del Moral, 2001; Bakker, 2002; Bukowski, 2007; López-Gunn, 2009). This enduring traditional paradigm focused on resource supply for socio-economic growth on the base of publicly funded large-scale hydraulic infrastructures that were developed without economic viability analyses, with a technocratic and top-down design and implementation process and, for part of the 20th century, executed under authoritarian political regimes. The beneficiaries of this model constituted a policy community (Pérez Díaz and Mezo, 1999), composed primarily of irrigators, hydroelectric companies and public infrastructure developers, which have been determinant in the setting of water policy.

The new water governance approach embodied by the WFD required a significant shift in priorities, goals and operational procedures. It placed the emphasis on ecosystem protection and ecological health as a means to guarantee the availability of sufficient good-quality water to sustainably meet needs. It also emphasised participatory and transparent decision-making, opening the policy process to new voices and actors (Neto, 2010; Hernández-Mora et al., 2011; La Roca and Ferrer, 2010; De Stefano and Hernández-Mora, 2012).

Since the 1990s, a coalition of academics, social activists and water managers in Spain and Portugal has been promoting this shift from the hydraulic paradigm to what has been called a New Water Culture (NWC) (Table 1) (Martínez Gil, 1997; del Moral, 1998 ; Tábara and Ilhan, 2008; Font and Subirats, 2010; Aceros and Domènech, 2011; Swyngedouw, 2015; Bukowski, 2017). This group of actors coalesced around the New Water Culture Foundation (*Fundación Nueva Cultura del Agua* or FNCA, www.fnca.eu). This is an epistemic community (Bukowski, 2016) that emerged in 1998 with the first Iberian Congress on Water Management and Planning, held in Zaragoza, Spain, in 1998. Over the years, the FNCA has become an authorised voice in Iberian water policy debates; it has managed this through carrying out advocacy, applied research, policy analysis, support of local grassroots organisations, and academic and outreach publications. It has also organised successive Iberian Congresses in Portugal and Spain; this is the academic forum where new research and policy proposals pertaining to the key concerns of the NWC movement are presented biannually, with the latest event held in Madrid in Septembre 2020.

From the outset, the FNCA found legal and institutional support in the basic principles of the WFD. They coincided with some of the movement's core objectives, including the preservation and recovery of aquatic ecosystems through integrated management at the river basin scale, the use of economic instruments, and participatory governance. In fact, the scientific conclusions of the first Iberian Congress stated that, "[in order] to achieve the required supranational integration in the management of shared Iberian river basins underpinned by the New Water Culture paradigm, the legal framework articulated by the European Union and its Water Directive – which is currently being drawn up – will doubtlessly be essential" (Arrojo and Martínez Gil, 1999: 45). Consecutive iterations of the Iberian Congress[1] focused on an ongoing assessment of the WFD implementation process. It involved participation by academics, managers, activists, water professionals and others from both within and outside of the NWC epistemic community.

[1] For proceedings and conclusions of Iberian Congress editions see: https://fnca.eu/congresos-ibericos

Table 1. The hydraulic paradigm and the New Water Culture (NWC).

HYDRAULIC PARADIGM	NWC IN TRANSITION	NWC CONSOLIDATED
Water as a productive input	Water as a socio-ecological good	Water as a common patrimony and human right
Increase supply through publicly funded hydraulic infrastructures	Demand management and ecological conservation	Good status of all waters through integrated river basin planning and management
River basin planning and management focused on water distribution	Integrated water resources management with water quality and ecological considerations	Integration and coordination of sectoral policies at the optimal scale to achieve ecological, social and equity goals
Long term River Basin Management Plans at the service of sectoral policies	River Basin Management Plans incorporate economic rationality, demand management measures, and ecological goals	Iterative, flexible and adaptive river basin planning based on evaluation, monitoring and control
Limited information on water budget, and not publicly available	Information on water quantity and quality, institutional and economic aspects publicly available	Publicly available information on all water management and planning aspects
Publicly funded water works and highly subsidised water resources for economic uses	Economic rationality and cost benefit analysis of water infrastructures	Cost recovery as a means to encourage sustainable water use and application of the polluter pays principle
Participation restricted to permitted economic water users	Limited inclusion of environmental interests in formal participatory bodies	Inclusive and open participatory deliberative processes for water planning and management
Limited social and political conflict	Recognition of territorial, social and political conflicts surrounding water management practices	

Source: Adapted from Aguilera Klink (1999).

The defence of the WFD has not excluded advancing some critical perspectives concerning its actual implementation process or the implications of the economic vision in which it is embedded. The latter became particularly apparent with the effects of the financial crisis that started in 2008 and the subsequent policies of fiscal adjustment that were applied in both Spain and Portugal. For the most part, however, the Iberian NWC movement has not been formally involved in the critical analyses of the WFD that have been debated elsewhere, such as the consequences of shifting from government to governance (Kaika, 2003; Kaika and Page, 2003; Molle, 2009; Parés, 2011; Boeuf and Fritsch, 2016).

In the Iberian countries, European water policy is still largely welcome as a tool for advancement and progress and for overcoming the inertia of the hydraulic paradigm. This is the case despite the fact that the approval of the WFD occurred in the context of a neoliberal drift that was framed in the context of global processes that are historically related to the emergence of 'post-political' and 'post-democratic' conditions (Swyngedouw, 2011) that affect the chances of real participatory and democratic processes (Parés, 2011; Parés et al., 2015; Hernández-Mora et al., 2015).

The Iberian NWC identification with, and support of, the WFD has in fact continued to the present day. This is demonstrated by the FNCA's active involvement in the #ProtectWater campaign (www.livingrivers.eu/), a successful Europe-wide campaign to prevent the reform of the WFD that campaign proponents feared would result in a loss of ambition and a change in its fundamental goals. The campaign, led by environmental actors such as the European Environmental Bureau, contrasted with the view of more socially oriented organisations such as the European Water Movement (EWM), that saw in the potential reform an opportunity for the explicit recognition of the human right to water (EWM, 2017). In Spain, the FNCA contributed to the unified position of environmental and social organisations in supporting the #ProtectWater campaign. In June 2020, the Commission announced its decision to focus on supporting the implementation and enforcement without changing the WFD, after it was considered

to be "fit for purpose" (EC, 2020a). At the end of the process, the European Water Movement also celebrated the conservation of the WFD in its current form (EWM, 2020).

The embrace of the WFD by progressive scientific and social movements such as the NWC can be understood within the framework of Cédric Durand's concept of "selective disintegration/reintegration". It identifies some scenarios, particularly in the field of environmental policy, where European regulations are ahead of state legislation and can act as a basis for progress. In these situations, it would be sensible to apply a "strategy which, apart from the criticism of and battle with neoliberalising aspects, consists of maintaining and even strengthening integration factors that do not directly come from subordination to the logic of capital" (Durand, 2018: 15). This selective disintegration/reintegration strategy has been practised by the Iberian NWC movement and is reflected in the published work of the FNCA and its members. This practice has largely been implicit, not theorised, but based on the FNCA's scientist-activist involvement in, and commitment to, the geographically and historically concrete conditions of Spain and Portugal, as has been discussed in the context of the water desalination debate (del Moral et al., 2017). The emergence of water-related privatisation processes, however, including water markets, privatisation of urban water supply services and demands for a fair ecological transition, have gradually connected the debates over the WFD with broader political and theoretical concerns.

This paper can be understood, from a methodological perspective, to be the result of a long-lasting research-action experience. The FNCA's ongoing engagement with, and evaluation of, water policies in Spain and Portugal is reflected in position papers, reports, policy evaluation activities, technical and academic publications, the conclusions of the ten Iberian water congresses, and the review of other relevant official documents and academic papers. These serve as the basis for our analysis. Our exploration, furthermore, is grounded in the practical and academic engagement of the authors with water policy debates in Spain and Portugal. As Font and Subirats (2010) point out, "The proactive involvement of the New Water Culture Foundation has contributed greatly to the questioning of core policy beliefs and the promotion of alternative ideas on water management".

The paper is organised into four sections. After this introduction, the next section looks at the key water policy transformations brought about by the implementation of the WFD in Spain and Portugal, along with the identified barriers. The subsequent section looks at the pending challenges in the water policy arena, both from within and outside the direct purview of the WFD. The paper ends with some concluding remarks.

THE ROLE OF THE WFD IN THE TRANSFORMATION OF THE WATER POLICY FRAMEWORK IN SPAIN AND PORTUGAL: PROGRESS AND BARRIERS

The implementation of the WFD has played a pivotal role in the gradual transformation of some aspects of water management and governance in both countries, in spite of political resistance from members of the traditional water policy communities that have hampered progress. The integrative approach of the WFD incorporates hydrological, ecological, economic and social dimensions in the process of water planning and management in Europe. As such, it has addressed the recurrent frustrations that have resulted from the previous fragmented approach which focused on water quantity and chemical quality for specific uses. But it also resulted in tensions regarding the traditional modus operandi of engineering companies, traditional water users and public administration in many European countries. In Spain and Portugal, these tensions have hampered the operational development of the WFD and have affected the elaboration of River Basin Management Plans (RBMPs) (Hernández-Mora et al., 2011; Schmidt et al., 2015a).

In Spain and Portugal, as in other European countries, the adoption of the WFD significantly restructured water management practices, providing an important driver for institutional change (Thiel and Egerton, 2011). Existing governance systems have been affected by the rescaling and shifting of responsibilities to address new coordination requirements in the management of water.

Below is a review of the changes that have taken place in relation to the main components of the WFD: institutional setting, environmental objectives (good status of waters), use of economic instruments to inform water management decisions, information requirements, and the opening up of the decision-making process to a wider array of stakeholders.

Institutional settings, water planning and policy goals

Between 1997 and 2001, under the 1919 Water Law, the Portuguese National Institute of Water (*Instituto da Agua*, or INAG) developed a first generation of RBMPs and a National Hydrologic Plan (NHP). These plans, influenced by the debates surrounding the drafting of the WFD, became the first laboratory for collaboration between social and natural sciences and were precursors of the first wave of WFD-inspired RBMPs.

The approval and implementation of the WFD in Portugal brought important institutional reforms. The 2005 National Framework Water Law replaced the 1919 law, introducing new objectives and management procedures. Planning and management was decentralised to the river basin scale through the creation of Hydrographic Regional Authorities (*Administrações Regionais Hidrográficas* or ARHs), five in Continental Portugal and two in the Autonomous Regions of the Azores and Madeira, to manage each of the river basin districts (see Figure 1). These authorities had the mandate to develop new RBMPs that were adapted to the WFD goals and to play an intermediary role in the communication between the central administration, local authorities and communities, and other actors. The reforms effectively introduced a 'new water order' and an integrated approach to water management (Neto, 2010).

Figure 1: River basin districts in Spain and Portugal.

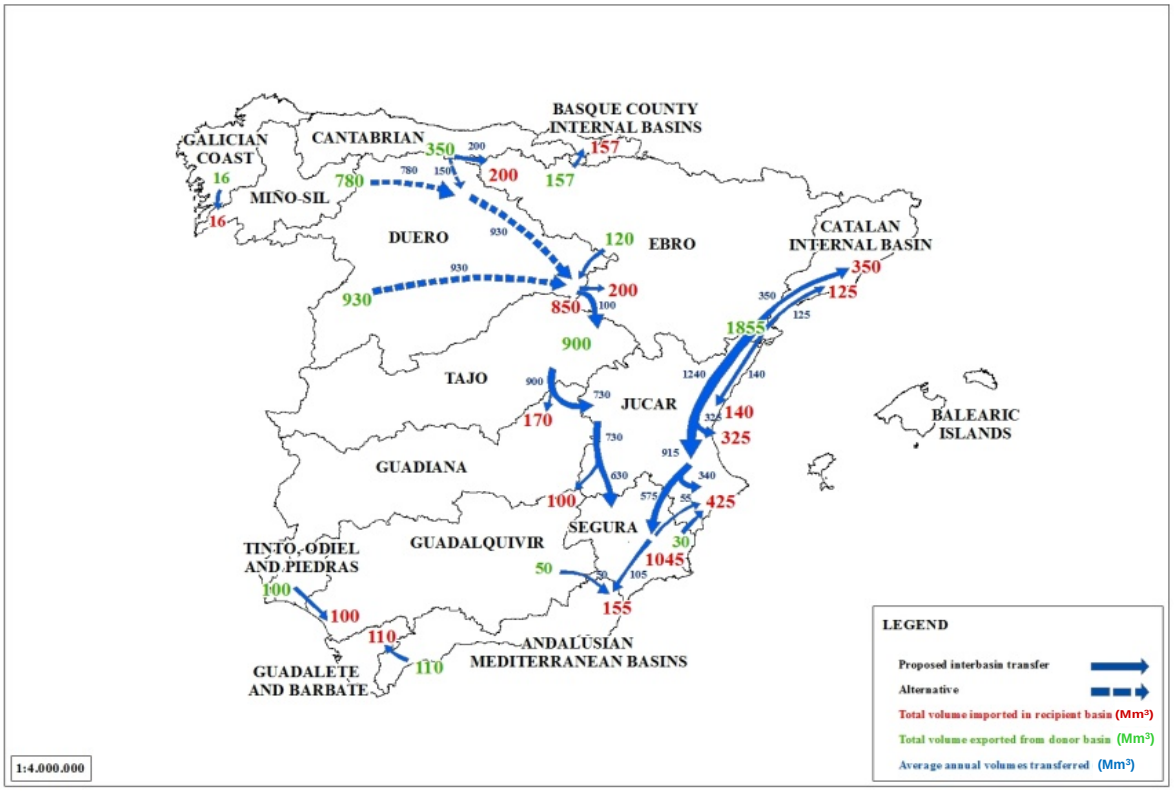
Source: Elaborated by Antonio Figueroa (Agua y Territorio).

Between 2012 and 2013 Portugal experienced a significant change in political direction. This was due to the need to implement the austerity measures imposed by the 'troika' of the European Commission (EC), the European Central Bank and the International Monetary Fund in the context of the financial crisis. In the field of water management, this led to a change in institutional design and a reconcentration of all political decision-making power into one single centralised body, the Portuguese Environment Agency

(APA). The ARHs that had been created in 2007, and which were responsible for the planning and implementation of the WFD, lost their autonomy. This resulted in a deep fracture in ongoing water planning and management processes, including losing the territorial proximity of the ARHs to the river basin districts, which were now managed centrally from the APA in Lisbon. The ARHs also lost their capacity for agency in the Portuguese planning context (Schmidt et al., 2015a).

In Spain, River Basin Authorities (RBAs) and basin-scale water planning, whose purpose was the augmentation of supply, had been in place since the early 20th century. The 1985 Water Law replaced the 1879 law and adapted water legislation to the new administrative and political democratic regime that had taken over in 1975. It incorporated the protection of chemical water quality and sustainability concerns as policy goals but maintained the basic premises of the hydraulic paradigm. This approach culminated in 1994 with the *Sistema Integrado de Equilibrio Hidrológico Nacional* (SIEHNA, the Spanish National Water Balance Integrated System), an ambitious grid of interbasin water transfers that was part of a proposed National Hydrological Plan (NHP) (Hernández-Mora et al., 2014). The proposed NHP was significantly contested, publicly and politically and acted as a catalyst for the consolidation of the NWC movement (Font and Subirats, 2010). Figure 2, which is based on official maps and documents of the time, shows the proposed grid of interbasin water transfers. It illustrates the lack of consideration of the transboundary nature of many Iberian river basins, with Portugal not even shown on the map. This is characteristic of water management approaches under the hydraulic paradigm that was in place before the approval of the WFD.

Figure 2. The Spanish National Water Balance Integrated System (SIEHNA) proposed in the 1994 draft of the National Hydrological Plan (NHP).



Source: Hernández-Mora et al., 2014.

Between 1998 and 2001 the Spanish Ministry of the Environment approved a first wave of RBMPs and a downsized version of the NHP. In contrast to Portugal, these plans largely ignored the debates surrounding the WFD and focused on the basic tenet of the hydraulic paradigm: publicly funded infrastructure development for supply augmentation. A 2003 reform of the 1985 Water Law transposed the WFD into national law (Hernández-Mora et al., 2014).

Although both countries had experience in basin-scale water planning, the change in policy objectives brought about by the WFD required a significant shift in planning goals, procedures, and information requirements. In the case of Spain, these difficulties were aggravated by interregional conflicts, political confrontations, and resistance by the traditional water policy community to the reorientation of policy goals.

This resistance has exhibited a variety of forms, one of them being the 'Spanish singularity' claim. The approval of the WFD challenged the status quo in different ways and triggered opposition from privileged users. The Spanish water administration, largely sided with these users, took a position in favour of the traditional Spanish water management model (embodied by the 2001 NHP) and criticised the innovations introduced by the new European water policy. The main argument, which was repeated in different forums by the defenders of the Spanish model, was that it was entirely impossible to implement a directive in Spain that had been conceived in and for the socio-economic and hydro-climatic characteristics of Central Europe (see, for instance, Gil Olcina and Rico Amorós, 2007: 195-6; Del Campo, 2013: 2; Omedas, 2013: 2; Sancho, 2018). The insistence on Spanish singularity was justified by the existing water scarcity in Southeastern Spanish river basins and by the temporally and spatially irregular distribution of precipitation in the Iberian Peninsula as a whole that needed to be corrected by the construction of storage and transport works to interconnect the peninsular basins. The Spanish singularity has also been claimed in relation to the cost-recovery principle (see below) and, in more general terms, with regard to the applicability in Spain of the WFD and of European environmental legislation. Sancho (2018) clearly expresses this by stating that,

> the Spanish singularity in Europe must be considered, even compared to the rest of the Mediterranean countries: in no other country does the great spatial and temporal irregularity of water resources appear. In no other country is the use of water so dependent on the alteration of the natural regime of resources achieved by human action. And this must be taken into account both in the application of the WFD and of other environmental Directives.

As a result of the described difficulties in both Spain and Portugal, the first wave of WFD RBMPs were approved late. In the case of Spain, approval of first planning cycle RBMPs was received between 2011 and 2014, and Portugal's RBMPs were approved between 2011 and 2013; this was significantly later than the WFD's December 2009 deadline. The RBMPs also contained significant shortcomings (OPPA, 2015a). In the case of Portugal, the RBMPs were poorly integrated into other territorial instruments and ARHs were unable to create a common 'agenda for change' in the territories that shared the same river basin. The dissolution of the ARHs has further limited the necessary reforms.

Status of water bodies

The main goal of the WFD is to achieve the good status of all water bodies. This is a significant shift from previous policy goals in Spain and Portugal. However, progress has been slow. In Spain in 2018, only 60.4% of surface water bodies and 52.4% of groundwater bodies had achieved good status (MITECO, 2019a). Data reported to the European Commission showed little progress between the first (2009-2015) and second (2015-2021) river basin planning cycles. The situation in Portugal is similar for surface water bodies, with 53% in good status, but is better than Spain for groundwater, with 75% of water bodies in good status (Chainho and Martínez-Fernández, 2018).

However, because of gaps and shortcomings in the evaluation methodology used, this data may not adequately represent the real situation. In Spain, for instance, reference conditions have not been

determined for all relevant indicators. Hydromorphological conditions are monitored in only 11% of river water bodies, and fish are monitored in only 9% of surface water bodies despite being a key indicator for hydromorphological pressures (MITECO, 2019a). In 37% of surface water bodies, only one biological element was considered. If all the indicators required by the WFD were used to evaluate ecological status, the number of surface water bodies with good status in Spain would decrease (Willaarts et al., 2014). Studies carried out by Munné et al. (2012) showed that when individual biological indicators were applied in isolation in Catalan river basins, between 56 and 62% of surface water bodies showed good status, but the percentage decreased to 36% when (as required by the WFD) all the indicators were considered simultaneously. Due to these and other shortcomings, the European Commission concluded that the indicators that were being used to classify the status of many Spanish water bodies made such classification "inconsistent with the requirements of the WFD and call[ed] into question the validity of the assessment/classification of status of surface water bodies in Spain" (EC, 2019). Moreover, between the first and the second planning cycles there was a 39% decrease in the number of surveillance monitoring sites and a 19% reduction in the number of operational monitoring sites (ibid). This reduction has been justified by budgetary constraints resulting from the economic crisis, but the situation has not substantially improved since then.

A poor application of the WFD seems to be the main reason behind the notable amount of water bodies not reaching good status. A recent FNCA report (OPPA, 2015b) highlighted some shortcomings in the case of Spain. These included 1) the absence of specific environmental objectives for water bodies in Natura 2000 sites; 2) the erosion of objectives between the first and second planning cycles which occurred, without detailed justification, through an abusive use of exemptions under Articles 4.3 to 4.7 of the WFD (EC, 2015a: 70; EC, 2019: 137) and 3) the low priority given to environmental measures in the RBMPs' Programmes of Measures. Measures related to environmental objectives only account for 58% of the second Spanish RBMPs' allocated budget (MITECO, 2018). Furthermore, if basic measures to address point pollution pressures are not considered – primarily wastewater treatment facilities to comply with Directive 91/217 on urban wastewater treatment – then environmental measures represent only 20.4% of the total budget. On the other hand, the budget allocated for new infrastructures and measures to augment water supply, which should have considered pressures instead of measures, is larger. In addition, Programmes of Measures have a low level of implementation in both countries due in part to the limitations imposed by the economic crisis and, in the case of Spain, because of inadequate coordination among competent authorities (Chainho and Martínez-Fernández, 2018; De Stefano and Hernández-Mora, 2018; MITECORD, 2020).

In Portugal, the first and second planning cycles suffered significant delays and the third planning cycle is only now (2020) starting; the proposed Significant Management Issues documents are under public consultation until September 2020[2] for the seven hydrographic districts (five on the Portuguese mainland and two in the Azores and Madeira; see Figure 1). The RBMPs of the first cycle were completed and approved in 2013 and were reported to the Commission in September of that year, except the RBMP for Madeira, which was submitted to the WFD's Water Information System for Europe (WISE) database only in April 2014. In its evaluation of the Portuguese first cycle RBMPs (EC 2015b: 6-7), the EC stated that all RBMPs were "quite complete with detailed explanations on methodology, assumptions and approaches, complemented with maps, drawings and data tables"; the evaluation pointed out, however, that in almost all river basin districts there was "limited information on several water bodies [so that they] could not be classified in terms of ecological and chemical status or have only preliminary classification" (ibid). The EC report also pointed out that reference conditions for the classification of transitional and coastal waters had not yet been defined and thus the classification of their status should be considered preliminary.

[2] https://apambiente.pt/ajaxpages/destaque.php?id=1359

Since 2009, the monitoring network in Portugal has presented maintenance challenges. As a result, is has had serious limitations, mainly for surface waters. As with biological assessment methods in Spain, in Portugal only a few biological quality elements were used for the classification of water bodies. There was also limited information on the methodology that was used to identify significant pressures, and the definition of ecological flows was non-existent or very preliminary. Overall, the report considered that, "the lack of base information, together with a lack of analysis of the expected impacts of the measures renders unclear if and what WFD objectives will be attained for many water bodies" (ibid).

Hydroelectric production and agricultural irrigation continue to be significant and growing pressures on Portuguese waters. In 2007, a new National Programme for Dams with High Hydroelectric Potential was approved in Portugal. It proposed the construction of ten new dams in the country. The programme was launched by the government as a central component of Portugal's new energy policy, aimed to increase the use of renewable energies and to reduce energy dependence on outside sources. Although the approval of these dam projects followed established environmental impact assessment procedures, including social and economic considerations, such dam projects represented one of the biggest obstacles to the fulfilment of WFD goals (Chainho and Martínez-Fernández, 2018). Its approval and scheduled implementation escaped the requirements of the WFD for new modifications of water bodies (Article 4.7) regarding, among others, mitigation measures, inclusion and justification in the RBMPs and demonstration of the lack of alternatives. In 2011, the Alvito Dam project was cancelled and the Fridão project postponed; in 2016, the Fridão Dam was suspended and a new memorandum of understanding was signed between the Government of Portugal and the *Energias de* Portugal (Portuguese Energy Operator or EDP); the Fridão Dam project was finally cancelled in 2019. In the case of both projects, pressure from environmentalists increased not only with respect to the projects but against the whole dam-building programme. The cancellation of many of these projects, however, resulted more from a loss of interest by companies than from a strong political commitment to achieve good status for surface waters. The Alvito Dam project, for example, was cancelled due to its economic infeasibility and the Almourol and Pinhosão Dam projects were never initiated due to lack of interest from hydropower companies, mainly because of the unfavourable economic context (Chainho and Martínez-Fernández, 2018).

In 2018, a new National Irrigation Plan was presented in Portugal; it proposed more than 90,000 hectares (ha) of newly irrigated land and received a public investment of €534 million. Climate change adaptation is the main driver and justification for these large investments and the core matter for discussion is water resources allocation. Several new multipurpose dams have been proposed for the Tagus River Basin. This follows the model of the Alqueva Dam in the Guadiana Basin, which was constructedin order to meet the demands of the agriculture sector and started service in 2000. They are encountering strong opposition from environmental organisations and analysts.

In Spain, agricultural water demands are the major driver of quantitative and qualitative pressures on surface and groundwater bodies. In addition to the planned development of new infrastructures and the planned expansion by 700,000 ha of irrigated agriculture in the second round of RBMPs (Martín Barajas and González Briz, 2015), few measures are designed to reduce agricultural pollution (EC, 2019).

Moreover, the amount budgeted for agricultural pollution control measures is only 4.8% of that allocated for point pollution (MITECO, 2018). This is the case despite the fact that agricultural pollution is increasing and is affecting drinking water sources and valuable ecosystems while urban point source pollution is declining. A particularly serious example of the widespread agricultural diffuse pollution of water bodies in Spain is the eutrophic crisis of the Mar Menor lagoon in Southeastern Spain, which is caused primarily by the thousands of hectares of intensive irrigated agriculture in its watershed. This eutrophic crisis has led to the ecological collapse of the most important lagoon of the Western Mediterranean (Ruiz et al., 2019). It has also led to significant socio-economic losses and given rise to important sociopolitical conflicts. In July 2020, the European Commission issued a reasoned opinion to Spain pertaining to an infringement procedure of the Nitrates Directive (91/676/EEC), (EC, 2020b) as

previous step to take the case to the European Court of Justice, for the failure of Spain to design and implement effective measures to achieve the objectives of the Directive.

Uses and resources – Basin closure

Water abstraction for consumption and non-consumption uses constitutes one of the main pressures on water bodies in Spain, since it is a major cause for the reduction of water flows and the impact of hydraulic infrastructures on river ecosystems. Consumption demands are of special concern, representing about 28% of the country's total renewable water resources (MITECO, 2019a); this is well over the stress threshold of 20% (EEA, 2019). Of consumed water resources, agricultural demands accounted for 77% in 2018. This is expected to increase to 80.5% by 2021 (MITECO, 2019a), which is double the European average (EEA, 2019). Irrigated hectares have also increased in Spain over the past six decades and continue to do so (Subsecretaría de Agricultura, Pesca y Alimentación, 2019).

In some Spanish river basins the Water Exploitation Index plus (WEI+), measuring water consumption against renewable water resources, exceeds the 40% threshold (García-Bautista and Martínez-Fernández, 2016; EC, 2019), indicating severe water stress (EEA, 2019). This stress is more pronounced in southern and Mediterranean river basins and is particularly severe in the Segura River Basin; here the WEI+ is 158% if it includes the resources from the Tagus-Segura water transfer, and around 215% if transfer inputs are excluded. In these basins, the reduction of water demands, particularly from agriculture, is a necessary condition for restoring the good status of water bodies and preventing further deterioration. Excessive water concessions to irrigated agriculture, for example, are directly responsible for the lack of adequate ecological flow regimes in many Spanish rivers (Martínez-Fernández et al., 2018; EC, 2019).

Climate change processes are also exacerbating quantitative pressures. Models predict increased occurrence and intensity of drought and flood events throughout the Iberian Peninsula in the 21st century (Santos, 2018). Predictions also point to a decrease in river runoff and aquifer recharge, particularly in the southern parts of the Iberian Peninsula, thereby increasing the spatial asymmetry of water availability. In Spanish river basins, a decrease of 3 to 24% in average runoff is expected, depending on the scenario and period considered, as compared with the 1961-2000 hydrologic series (CEDEX, 2017).

These effects are already apparent. Average natural water flows for example, have decreased significantly from the 1980s onwards, with some Mediterranean basins experiencing a reduction of as much as 40% from the average values of the previous four decades (MITECO, 2019a).

The combined and synergistic effects of increasing demands and ongoing climate change in Iberian river basins will increase water pressures and thus the risk of basin closure (Molle et al., 2010). RBMPs do not adequately address these important risks since the bulk of the measures are not directed at controlling the drivers of pressures, where the agricultural and hydroelectric sectors play a key role.

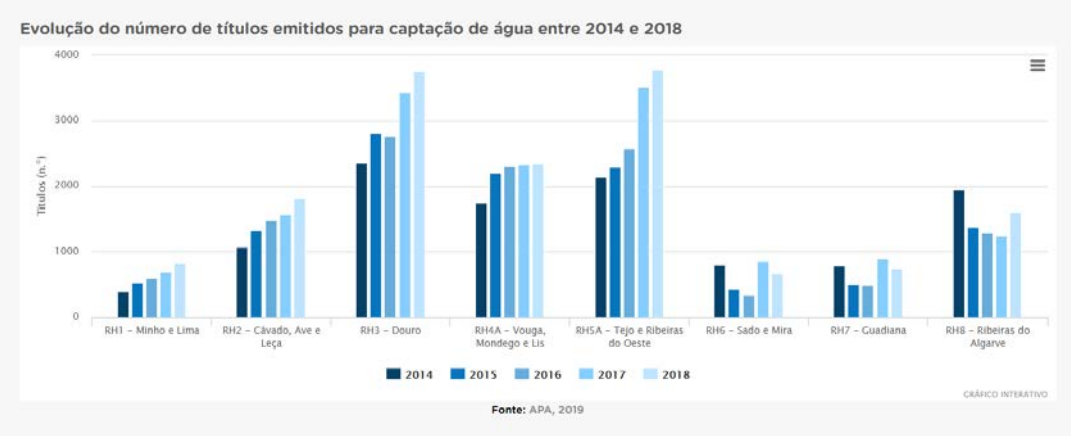
In the case of Portugal, strong interregional and interannual variability of precipitation is a well-studied climatic context. Most of the annual precipitation is accumulated through migratory storms between November and April. On average, 42% of the annual precipitation falls in winter (between December and February) and only 7% in summer (between June and August) (Carvalho et al., 2014). Studies have shown that, since 1970, precipitation in the cold season – from November to April – has been decreasing significantly in the Mediterranean climate region (from the Atlantic coasts of Portugal and Morocco to the Middle East). Portugal has experienced increasing droughts over the last four decades, with particularly severe droughts in 2004-2005 (the driest in 78 years) and 2011-2012 (ibid). In the last three years, water scarcity in Portugal has been aggravated by both increasing drought events and increasing water demands for agriculture, with significant decreases in ground water levels and replenishment rates (APA, 2020).

The predicted intensification of drought periods in the context of climate change and the uneven distribution of available water resources in different river basin districts is leading to critical situations of

water scarcity at the regional level. The situation may be aggravated by a lack of action to prevent soil loss and erosion before and after the forest fires that occur during droughts, due to natural and human causes. An example of the critical consequences of the serious hydrological drought of 2018-2019 was the case of the Fagilde Dam in northern Portugal in 2018-2019, where the lack of preventive measures and the late response of the water authorities resulted in a failure of the water supply to several municipalities in the region (Henriques, 2018).

Between 2014 and 2018, the demand for new water use permits grew significantly (Figure 3); the highest water use allocations took place in the largest river basin districts, that is to say Douro, Tagus and Mondego. As in Spain, irrigated agriculture constitutes the largest water use in Portugal (more than 80%), followed by residential use (about 12%) and industry (about 7%) (APA, 2012).

Figure 3. Evolving water allocation between 2014 and 2018 per hydrographic region.



Source: APA (2020).

The value of the 'scarcity Index' in Portugal for 2019, calculated considering the average annual flows (percentile 50%) and the current water needs and various sector uses, is 14%. This value corresponds globally to a 'low scarcity' level in the country, however, as in Spain, the problem is more serious in some basins that reach higher levels of scarcity.

In order to reduce agricultural quantitative pressures, Spanish RBMPs focus on increasing efficiency through the subsidized modernization of irrigation systems. However, the effectiveness of this policy, which frequently confuses water use with water consumption and water efficiency with water savings, has been widely questioned. First, although water withdrawals often decrease at the farm level, overall water consumption does not, since modern irrigation technology substantially reduces irrigation returns into rivers and aquifers (Lecina et al., 2009; Sampedro-Sánchez, 2018). Second, irrigation modernisation projects are often followed by intensification processes leading to increases in crop production, such as double crops and more water-intensive crops (Ruiz, 2017). These neutralise any unitary water savings and usually lead to an increase in total water consumption. Third, water permits are usually not revised after the modernisation projects. Thus, potential water savings are often used to increase the irrigated area instead of returning that amount to the overall water budget or allocating it to environmental flows (Corominas and Cuevas, 2017). The paucity of water savings and the increase in total water consumption at larger geographical scales (sub-basin or basin level) has been widely demonstrated (Scott et al., 2014; Perry et al., 2017; Grafton et al., 2018), including in Spain (Lecina et al., 2010; Rodríguez-Díaz, 2011; Fernández García et al., 2014; WWF, 2015; Berbel et al., 2015, 2017; González-Cebollada, 2018). Irrigation modernisation projects, moreover, can negatively impact the environmental and cultural heritage of historical irrigated systems (Martínez-Fernández, 2013).

Effective measures directed at drivers of water demand are lacking. Spanish RBMPs, for example (with the exception of Guadiana RBMP), do not include in their Programmes of Measures the revision of water rights to adapt them to a new context of decreasing resources (OPPA, 2015b; Environmental Organizations, 2016; EC, 2019). Moreover, the new river basin Special Drought Management Plans in Spain, approved in December 2018, are more focused on minimising impacts on economic sectors than on protecting the good status of water bodies (FNCA, 2018). This again shows the generalised conflict between the environmental objectives of the WFD and the traditional aims of the Iberian water policy, where the goal of satisfying water demands endures in a context of considerable inertia.

Economic instruments to reach water policy goals

In Europe, the WFD was the first legal instrument to incorporate economic requirements into water policy (Roseta-Palma et al., 2013). Article 5 refers to the economic analysis of water uses as being integral to the characterisation of each River Basin District (RBD), and Article 9 highlights the principle of cost recovery and the role of prices as an incentive for efficient water use (ibid).

The economic analysis required for WFD implementation had two phases (ibid). The first included a characterisation of water uses, scenarios and the potential for cost recovery, and the second was more focused on the selection of Programmes of Measures to meet good ecological status. There was also a request for an assessment of the disproportionality of costs compared to benefits when considering the possibility of exemptions to the fulfilment of the good status goals (ibid).

Cost recovery and the use of economic instruments were not new elements of the Spanish water administration; the 1985 Water Law already foresaw different types of tributes, some of which were added after the approval of the WFD in 2000. However, given the focus of pre-WFD Spanish water policy on increasing water availability for productive uses by means of state-funded hydraulic infrastructures, the few cost-recovery instruments were limited and were focused on the financial and operational costs of these infrastructures.

The Spanish singularity concept (as presented in a previous section) and the associated need for hydraulic works addressing such singularity have been used by the traditional water policy community to claim the inapplicability of the WFD economic instruments to the Spanish case. In effect, a strict interpretation of the cost-recovery principle associated with the polluter/user pays principle crashed head-on with this view. Ongoing debates focus on the effective level of cost recovery, the contribution of the different sectors and the adaptation of the current legal instruments to fulfil the economic mandates of the WFD. In this context, proposing a -more or less- full recovery of costs was necessarily a highly sensitive political issue.

In order to face the users' opposition to pay an increased proportion of the cost of water services, the government overestimated the actual contribution of users to covering these costs. In an extensive report published in 2007 (MMA, 2007: 173), the Environment Ministry, responsible for water policy, stated that cost recovery for all financial water services ranged between 65 and 96% for different sectors (urban, hydroelectric, irrigation) and river basins. The high recovery figures, however, were determined through dubious accounting operations such as defining specific categories labelled 'public good services' that were exempted from recovery. These categories included flood abatement measures (with varying percentages of the costs of various dams in different river basins); actions aimed at the protection and improvement of the water environment; monitoring and control of water uses and the general costs associated with water administration (MMARM, 2009: 22).

Moreover, the fiscal instruments foreseen in the 1985 Water Law still in force, are insufficiently adapted to the new requirements of the WFD. This leaves the state without the appropriate tools for achieving a sufficient level of recovery and a fair distribution of costs (WWF-FNCA, 2017). An example of this is the tariff that is charged for the use of publicly funded hydraulic works. This tariff can only partially recover the financial cost of the infrastructure since it is designed to operate only when the official

interest rates exceed 6%, something that has not happened in Spain since 1997. Environmental costs, as introduced in WFD-related legislation, are estimated as the costs of the measures undertaken in attaining environmental goals. This approach, however, overlooks the damage to the environment that occurs when no action is taken. That is to say, no measures, no costs. Resource costs – which is certainly a flawed concept – lack both an estimation and a recovery tool. According to the basin planning guidelines – *Instrucción para la Planificación Hidrológica* (Instruction for Water Planning) – resource costs are defined as scarcity costs, that is, the opportunity costs associated with the allocation of a scarce resource to one user or region over another. The Instruction indicates that water market instruments can be used as a proxy to describe scarcity costs. However, only some RBMPs with operating water markets have described these costs.

This strategy both appeased users – who have continued enjoying low-cost water – and allowed an appearance of cost recovery to be reported to European authorities. The EC has nevertheless repeatedly urged the Spanish government to overcome these shortcomings and to develop an effective price policy as stated in Article 9 of the WFD. As late as 2015, the EC was still reporting that in Spain cost-recovery instruments had not been adapted to the WFD requirements (EC, 2019). Without such instruments in place, there remains a lack of incentive for efficient water use and no guarantee that the various users will contribute adequately to cost recovery. Environmental and resource costs are high but are not included. RBAs do not have sufficient resources to exert effective control over water uses (EC, 2015a: 9).

Years of denial and procrastination have delayed the correct adaptation of the Spanish legal framework to the demands of the WFD in terms of the use of economic instruments. Good news, however, appears to be on the horizon in the form of a recognition of the need to change. A national debate on the reform of water governance in Spain has identified the key water governance challenges to be the absence of adequate cost-recovery mechanisms and the lack of financial resources for the Spanish water administration (MITECORD, 2019). The recently published provisional documents on significant water management issues (MITECORD, 2020) include as an issue of concern the RBAs' lack of the financial resources that they need to perform their tasks. In the chapter devoted to cost recovery, they acknowledge that the instruments for recovering the financial cost of the measures are inadequate and that there are no instruments for recovering environmental and resource costs. Proposals to tackle these problems include a reform of the cost recovery instruments included in the legislation in order to allow for a higher level of recovery and the use of general taxation as a way of increasing the budget of the water authorities (MITECORD, 2020). In both instances, the application of the polluter pays principle is overlooked.

In Portugal, as in Spain, there had already been taxes and fees associated with different types of water uses. The concept of cost recovery, however, was introduced by the WFD. Portugal presented its first economic characterisation in 2005 (Roseta-Palma et al., 2013); however, the role of prices, water-related tariffs and tax policy did not gain visibility or social space, nor did the application of cost-recovery principles. The 'divide' between Portugal and Spain thus increased, with very different cost-recovery mechanisms for different water uses – for example, irrigation activities – applied on either side of the border.

Portugal introduced a new cost-recovery instrument in 2005, the *Taxa de Recursos Hídricos* (Water Resources Tax).[3] This was a tax that was aimed at recovering environmental and scarcity costs. It introduced the polluter pays principle into the mandatory payment for water use. This accounted for pollution and other impacts on water bodies and included the administrative costs of planning, management, monitoring and water quality protection.

The application of this charge in Portugal, allegedly, had the aim of operationalising the principles of Article 9. However, the components included in its calculation, as well as the way it was conceived and

[3] https://noctula.pt/taxa-de-recursos-hidricos-trh, Accessed 02-03-2020.

its scope (for example taxing the domestic use of water), generated negative reactions and opposing arguments and are still highly controversial in the Portuguese water policy context. Henriques (2016) argues that the income generated by these taxes is disproportional. The resulting income should be put into an 'environmental fund' that has been inactive for several years. This has caused a serious disinvestment in the maintenance of monitoring systems, insufficiency and fragility in the RBMPs and a failure to adequately implement the proposed measures.

Information, transparency and public participation

One of the main tenets of the WFD is the requirement for public information, consultation and active participation in water planning processes as necessary components of effective implementation of the directive (Article 14 and Preamble 14). As Jager et al. (2016) point out, however, "the wording of the Directive is in some respects highly ambiguous, and leaves considerable room for interpretation as to who should be involved, at what stage, and how – especially around the 'obligation to encourage' active involvement". As a result, while the legal obligation to inform and consult are clearly defined, different countries have interpreted 'active involvement' quite differently.

In Spain and Portugal, the elaboration of the WFD RBMPs entailed significant changes with regard to information required, the planning process, and the players involved. In terms of information, traditional water planning focused on the procurement and allocation of water resources and the protection of chemical water quality. The change in policy goals and the incorporation of ecological, socio-economic and territorial considerations, required new information, including (Del Moral et al., 2014) 1) ecological and hydromorphological data to define baseline conditions and respond to ecosystem-based management goals; 2) socio-economic information in order to understand the cost of water services, establish adequate water-pricing policies, avoid or mitigate undue burdens and select the most effective combination of measures and 3) indicators and monitoring systems to evaluate and adapt management plans.

These data were not available in a comprehensive fashion and thus, starting in 2004 in Spain and in 2007 in Portugal, a significant amount of time, as well as human and financial resources, were invested in gathering the necessary information to meet the new planning needs.

The process of implementation of the WFD, furthermore, coincided with the rapid development of "internet-based technologies that make data and information previously held within the limits of governmental institutions publicly available" (Pedregal et al., 2015). It also coincided with the social demand and, sometimes, political will to make governments more transparent and accountable. In both Spain and Portugal, available information regarding water policy and management has increased exponentially over the past two decades, although to different degrees in each country.

A periodic evaluation of the transparency of Spanish RBAs (De Stefano et al., 2012; Transparency International-Spain, 2020) showed a positive evolution of the information publicly available on their websites. The Transparency Index in Water Resources Management (INTRAG) aggregates 80 transparency indicators comprising 6 areas: information about the RBAs, relationships with stakeholders and the public, information on the planning process, transparency on water use and management, economic and financial transparency, and transparency in contracts and tenders. INTRAG evaluates the presence or absence of relevant information but does not assess its quality or ease of access.

An adaptation of the INTRAG index was applied in Portugal in 2014 (De Stefano et al., 2016). While the INTRAG average in Spain (for all RBAs and transparency areas) had reached 61% in 2015 (the last time the index was applied), in Portugal the average was only 29%. According to Schmidt et al. (2015b, as cited in De Stefano et al., 2016) the low Portuguese scores indicated,

> a disinvestment in the water sector and, in particular, in the dissemination of water-related information. With the extinction of the regional water agencies on the Portuguese mainland in 2011, the quantity and quality of information were further reduced, impacting transparency and the relationship with the public.

In any case, while information availability has improved, it is still inadequate and does not comply with legislation approved in both countries over the past 15 years in terms of access to information or transparency requirements.

Finally, user participation has been a long tradition in Spanish river basin planning and management since the 1920s when the RBAs were created (del Moral and Hernández-Mora, 2017). This participation, however, was traditionally limited to economic users (irrigators and hydroelectric) and only with the 1985 Law was there a timid opening up of formal participatory bodies to other economic and environmental interest groups (Varela and Hernández-Mora, 2010). The WFD opened up decision-making spaces to other actors through organising active public participation processes that complement existing participatory committees within RBAs in the different phases of development of RBMPs, that is, initial documents, significant water management issues, basin plans and Programmes of Measures.

The first wave of RBMPs (which were approved between 2011 and 2014) was accompanied by significant efforts to comply with the active participation requirements, with public participation processes undertaken in most river basins (Espluga et al., 2011; Pedregal et al., 2011; Ballester and Parés, 2013; Parés et al., 2015). As Hernández-Mora et al. (2015) point out, however, the results of these efforts were disappointing in that, "while the increase in information availability and public participation requirements should have involved an opening up of decision processes to all actors, research has shown that critical aspects continue to be decided upon behind closed doors by members of the traditional water policy community". The second round of RBMPs was developed under strict budgetary restrictions in the context of the financial crisis, and few efforts at active participation were undertaken.

In Portugal, the participatory process within the RBMPs is limited to two venues. The first is the National Water Council, an advisory body chaired by the Minister of Environment which provides recommendations for water policy and advises government decisions. The second venue of the participatory process within RBMPs in Portugal are the Regional Water Councils, which advise on water management plans, promote and monitor the production and dissemination of regional information and participate in water-related programmes (De Stefano et al., 2016). Between 2012 and 2015, governance tools such as River Basin Councils, which promote public participation and the decentralisation of political decision-making, were forgotten and weakened. This was highly demoralising to local and regional actors. In 2015, however, a new regulation for these River Basin Councils was created (Schmidt et al., 2015b).

The experience in Spain and Portugal echoes that of other European countries. In an evaluation of WFD public participation processes in various EU countries, Jager et al. (2016) concluded that, "Similarly, participation and involvement that does not afford participants real influence may serve to alienate stakeholders, further damage public trust in authorities, and undermine the legitimacy of resultant plans and measures".

It is also important to acknowledge that, to a large extent, the WFD establishes a top-down approach to catchment management, with objectives and instruments set through formal legislative and regulatory processes and steered by higher levels of government. Even if the involvement of stakeholders is promoted, the planning process is geared to supporting the achievement of WFD objectives rather than to responding to broader societal demands (Blackstock et al., 2015; Hendry, 2014; Rouillard and Spray, 2016). Paradoxically, achieving the WFD goals would require significant changes in commonly held social values and patterns of behaviour. Specifically, changes would be required in the power balance between the stakeholder groups that condition its implementation. The public participation mechanisms are precisely conceived as a tool to help achieve these important social transformations.

PENDING CHALLENGES FOR PRESENT AND FUTURE WATER POLICIES IN THE IBERIAN COUNTRIES

Progress has been made in a number of areas, including institutional reforms, increased understanding of the function and form of water ecosystems, better information on the ecological and chemical status

of water bodies, iterative and adaptive river basin planning processes, integration of sectoral water policies, new cost-recovery mechanisms in Portugal and the improvement in public participation processes. In spite of this, we have pointed to a number of criticisms that have emerged, particularly regarding limitations on the use of resources and lack of political will for a correct, comprehensive and ambitious implementation of WFD. These critical elements produce several pending water policy challenges, some related to the implementation of the WFD and others partially or totally outside its scope. In this section we briefly present some of these challenges.

Transboundary river basin management: The Albufeira Convention

A significant pending challenge is the need for improved coordination in the planning and management of the five Iberian transboundary river basins: Miño, Limia, Douro, Tagus and Guadiana. These shared river basins occupy 46% of the Iberian Peninsula (64% of Portugal and 42% of Spain) and represent 67% of Portugal's surface water resources (Figure 1).

Since the 19th century, Spain and Portugal have signed a number of agreements and treaties pertaining to the delimitation and management of their shared river basins. Of these, the most comprehensive and ambitious cooperation agreement was the Albufeira Convention (Convention for Cooperation on the Protection and Sustainable Use of the Waters of the Portuguese-Spanish River Basins, www.cadc-albufeira.eu/es/), which was signed in 1998 while the WFD was being negotiated. The Convention has several components: an institutional regime for cooperation (with a deliberative body and a commission for the implementation of the convention), a requirement for homogenization and exchange of information, reports on transboundary impacts, water quality protection, water uses, flood and drought management and transboundary flow requirements.

The WFD requires that for member states that are located "within a river basin where use of water may have transboundary effects", the "achievement of the environmental objectives (…) should be coordinated for the whole of the river basin district" (Principle 35, WFD). Furthermore, "in the case of an international river basin district falling entirely within the Community, Member States shall ensure coordination with the aim of producing a single international river basin management plan" (Article 13.2, WFD). This has proven difficult to achieve in Iberian river basins due to the lack of compatibility of information, the increased complexity of the planning process required by the implementation of the WFD (Neto, 2013) and, to some extent, the lack of political will. It has also been aggravated in the last 20 years by growing challenges such as climate change.

The Albufeira Convention included the definition of a minimum annual flow regime of water from Spain to Portugal for each river basin. This was clearly insufficient to guarantee downstream needs, so it was revised in 2008. This revision integrated the definition of minimum quarterly and weekly flows. It also considered an exception regime for drought periods, which exempted Spain from complying with established minimum flows. These changes are still insufficient, despite helping to guarantee the amount of water necessary to maintain the ecological status. There are already several moves towards renegotiating the flow regime in favour of the establishment of daily minimums and the incorporation of water quality considerations (Chainho and Martínez-Fernández, 2018).

Since the Albufeira Convention is the privileged scenario of cooperation between Portugal and Spain for the implementation of the WFD, it should facilitate compliance with the basic principles of the Directive. This is particularly true with regard to the need to coordinate the RBMP in international rivers. RBMP for such river basins should preferably be developed by both countries and ensuring public participation within the Cooperation bodies established to pursue the objectives of the Convention, namely the Conference of the Parties and the Commission for the Application and Development of the Convention (CADC). So far, the Convention has largely failed in these purposes

In the first planning cycle, the Spanish and Portuguese RBMPs were prepared at different times and with a clear lack of coordination. This was highlighted by the European Commission in its evaluation of

the Portuguese and Spanish first cycle RBMPs (CADC, 2017). In the second cycle, an attempt at coordination was apparent, culminating in the preparation of the coordination document for the 2016-2021 planning process. This document made it possible to understand the inconsistencies arising from the separate elaboration of plans for shared river basins (Chainho and Martínez-Fernández, 2018).

The integration of transition and coastal waters

Another important challenge in both countries is the effective integration of river basin planning with the management of coastal and transitional waters, that contain some of the most valuable water-related ecosystems in the Iberian Peninsula, always connected with, and dependent on, the functioning of large river basins. These basins include the Ebro Delta, the Albufeira in Valencia, the Mar Menor in Murcia, the Guadalquivir and Guadiana estuaries (the Guadiana estuary being on the border between Spain and Portugal), the Mar de la Paja in the estuary of the Tagus in Lisbon and the Douro estuary in Porto. These are heavily populated areas that concentrate vibrant economic activities, including intensive irrigated agriculture, tourism, navigation and fisheries. All these systems are under considerable ecological and hydrological stress because of the intense pressure they receive from human activities both on the coast as well as in the river basins on which they depend. Their ecological deterioration is serving as a true indicator of the (un)sustainability of river basin management practices.

The integration of the planning and management of coastal and transitional waters with continental waters, as required by the WFD, recognises the dependence of coastal ecosystems on river discharges of water, nutrients and sediments. In both Spain and Portugal, however, this integration is ineffective or almost absent. This is aggravated by the lack of integrated vision about the strong influence of river discharges on coastal ecosystems and fisheries, as observed for example in Ebro Delta and the nearby coast (Belmar et al., 2019) and in the lack of coordination between distinct, and sometimes distant, competent authorities. In the case of Portugal, there are no specific coordination instruments in place that can link and follow up the transversal measures between different levels of territorial plans. In Spain, at the end of January 2020, Storm Gloria affected the Mediterranean Spanish coast causing the Ebro Delta to be submerged for a few days (BBC, 2020). This event highlighted how the loss of sediment inputs to the Ebro Delta, retained in the Ebro reservoirs, was one the key drivers, along with climate change, of the critical situation of this socio-ecological system. It also demonstrated the urgent need to effectively integrate transitional and coastal waters into river basin planning and management.

Integrating the management of floods and droughts

Another important challenge is the need to better integrate flood and drought planning and management tools with RBMPs. This is particularly relevant in the case of the new Spanish Drought Management Plans which were approved in 2018. Drought Management Plans establish an indicator for defining and applying the "prolonged drought" exemptions, according to Article 4(6) of the WFD. This indicator, however, is defined in such a way that it allows for the declaration of prolonged droughts under ordinary climatic conditions, which allows for the reduction of ecological flows and the temporary deterioration of river water bodies. The Spanish Drought Management Plans thus represent a weakening of the WFD through facilitating the widespread use of exemptions and establishing planning processes that are independent of RBMPs and that do not comply with WFD requirements (FNCA, 2018).

Better integration of RBMPs with Flood Risk Management Plans (FRMPs) under Directive 2007/60 is also required. In Spain, FRMPs include regulatory measures, land planning, improved information, and better risk prevention. Grey flood-management infrastructures such as dams or canal works, however, continue to be an integral part of RBMP. This is in line with the old hydraulic paradigm and is far from the Floods Directive approach.

In Portugal, flood and drought risk management has been challenged by the dramatic economic crisis and by the public disinvestment that occurred after 2008. In 2012, the Portuguese government decided

to merge different governmental bodies as part of the austerity measures and financial restrictions that were undertaken. It phased out the Water Institute which was the centralised water authority and the seven *Administração da Região Hidrográfica* (Regional Water Authorities or ARHs) that were created in 2007.

The Portuguese Environment Agency (APA), besides its previous environmental competencies, was granted with increased institutional power and the mandate to integrate the institutional water authority. It was, however, under severe financial restrictions to operate all the systems in need of replacement or improvement.

The economic crisis and the disruption of institutional water governance in Portugal caused the operation of several monitoring stations to be discontinued, dismantled and never replaced. This made it very difficult to monitor the evolution of stream flows in important sections of the rivers. In 2010, the *Sistema de Vigilância e Alerta de Recursos Hídricos* (SVARH), a new monitoring and alert system, began operation. This allowed the establishing of flood management criteria for different river basin types including 1) international basins; 2) mid-sized basins with and without reservoirs and 3) small urban basins (Rodrigues, 2018).

Regarding droughts, adequate risk management plans are still missing in Portugal. After the severe 1990-1995 drought, however, the Portuguese water authority adopted a methodology that follows a specific control calendar which starts in January and follows up in March, May, and September (ibid). This monitoring and analysis allows for the projection of scenarios of available water for the coming year and facilitates managing and allocating available resources among different users, including agriculture, energy and urban supply.

The complex relationship of water reuse with sustainability

In June 2020, the EC published the regulation on minimum requirements for water reuse (EC, 2020c) to promote water reuse in agriculture and also stimulate "the circular economy, supporting adaptation to climate change, and contributing to the objectives of Directive 2000/60/EC by addressing water scarcity". Considered to be an important non-conventional water resource, water reuse can be an useful measure for achieving WFD goals, particularly in water-scarce basins. Spain reuses almost 11% of its urban wastewater, which is the highest percentage among continental EU members. It also reaches over 50% of water reuse in some of its Mediterranean river basins. In 2019, both Spain and Portugal launched significant water reuse national programmes; Spain launched the National Plan for Wastewater Treatment, Efficiency, Saving and Reuse (DSEAR) and Portugal put in place a national initiative to reuse 10% of the effluents of the nation's 50 largest wastewater treatment plants.

Water reuse, however, has a complex relationship with sustainability. If well planned and managed, it can help alleviate water scarcity in water-stressed areas and relieve pressure on water ecosystems. Unplanned water reuse initiatives, however, can be counterproductive for at least two reasons. First, when reuse is promoted uncritically as an alternative water supply measure, it can increase overall water demand and the resulting scarcity thus offsets the potential benefits. Second, direct reuse of reclaimed water limits return flows to rivers and streams, thus negatively affecting water flows and their ecosystem services. This is especially the case in certain Mediterranean regions where treated wastewater constitutes a significant proportion of stream flows. These negative effects of water reuse have already become apparent in Spain's water-scarce Segura Basin, where over 50% of urban wastewater is reused (Martínez-Fernández, 2020).

In order to avoid such undesirable effects, water reuse must be carefully planned within RBMPs to ensure that the incorporation of these new resources results in reductions in water abstractions from natural systems and that there are no negative effects on stream flows. There are additional challenges linked to water reuse, including uncertainties regarding emerging pollutants and the energy footprint of water reuse. There are also social equity considerations regarding the distribution of costs and benefits

between urban dwellers and the final users of reused water, who are usually farmers. The question arises because the increased costs of water regeneration are usually charged to urban dwellers.

CONCLUSIONS

Compared to the hydraulic paradigm that dominated in the Iberian countries throughout the 20th century and which is still present today, the WFD is perceived by the New Water Culture framework as a basis for progress. The conceptual approaches of the WFD (integration of the water cycle, a focus on good ecological status, the use of economic tools, and active public participation) and its procedural and methodological requirements (adaptive management, extensive monitoring and reporting, data availability and transparency requirements, the need for adequate justification of measures and decisions) constitute a reference framework whose potential has not been exhausted. The WFD's promise to transform key aspects of existing water policies and management procedures in the Iberian countries is still unfulfilled, precisely because of the lack of ambition for, and even outright resistance to, its implementation. This leaves enough room for substantial improvements. This explains the NWC's sustained support of the WFD, which has continued in parallel with criticism of its poor implementation and frustration with its slow progress towards its objectives.

The hydraulic paradigm, whose main goal is to support the economic development model dominant in each period through the development of the necessary hydraulic infrastructures, has maintained its dominance. The resistance of the beneficiaries of this paradigm – particularly irrigators and the hydropower sector – , with support, until very recently, from the water administration in both countries, helps explain the slow progress towards an ambitious WFD implementation and the improvement of the status of Iberian waters. Increasing agricultural water demands in both countries and the national programme to build hydropower dams in Portugal are good examples of this dominance. Another example is the significant limitations of existing cost-recovery instruments in terms of effectiveness and equity, which involves conflicting processes of water commodification in river basins and especially favour interbasin transfers. The contradictions between the formal implementation process of the WFD and the continuing dominance of the hydraulic paradigm's goals and dominant actors, have become apparent in the participatory processes, resulting in frustration of citizens, members of social and environmental movements and other pro-WFD stakeholders. Active participation processes are new in the Iberian countries and they collide with traditional democratic deficits and with the frequent lack of commitment to participatory processes on the part of public administrations.

The confrontation between different water policy strategies in Spain and Portugal, without directly questioning the dominant economic development model, have resulted in the emergence and intensification of sectoral debates – water, agriculture, energy, tourism, urban sector – and issues of a more integrated nature – limits to growth, environmental and territorial sustainability, new forms of political action, remunicipalization of urban water circle – bearing significant socio-ecological and political content. These issues implicitly and often explicitly underlie relevant socio-ecological issues that generate social conflict and political reflection. The water-related social mobilisations are spaces where the 'political', understood as the terrain for enacting emancipatory political-ecological transformation, can be constructed. Even more, they are spaces where necessarily the political must be socially constructed.

The hydraulic paradigm is being challenged by many processes, forces and actors. These include 1) climate change; 2) the increasing eco-conditionality of European funds and new priorities in the European budget under the Green Deal and the Covid-19 recovery plan; 3) the emergence and empowerment of new social actors defending a new water culture and the patrimonial value of water and related ecosystems and landscapes; 4) the social and economic impacts of the hydraulic paradigm on the deterioration in the quality of water supplies; 5) the impact on tourism that is linked to natural areas that are threatened by new infrastructures or by water pollution and 6) public opinion, primarily urban, that supports environmental conservation. The water actors who support the hydraulic paradigm are reacting

to these challenges by re-elaborating their discourses to present, for example, irrigation as the solution to climate change or new dams as being necessary to the mitigation of increased flood risks. Besides the need for a critical analysis of such fallacies, will such efforts to update the hydraulic paradigm still manage to be successful in maintaining public support? What will be the effect on Spanish and Portuguese water authorities of the European Commission's decision to not revise the WFD and, instead, demand more ambition in its implementation? Further research is needed if these key questions are to be answered.

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