

The Next Generation funds and their effect on the sustainability of the water cycle

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This brief aims to provide an analysis of the use of the Next Generation funds to achieve sustainable water management. To this end, the Spanish Government has drafted the Recovery, Transformation and Resilience Plan (RTRP). The document emphasizes the key role of water in the maintenance and restoration of good ecological status. The idea is based on the fact that environment-friendly water management is needed that guarantees the resource and the ecosystem services it provides. Therefore, for the future, integrated management of water in all its forms (inland, ground, fresh, brackish, transitional and coastal waters) is necessary. It is also crucial to take into consideration the relationship between aquatic systems and the land ecosystems that depend on them. This approach is proposed by Directive 2000/60/EC of the European Parliament and of the Council, of 23rd October 2000, establishing a framework for Community action in the field of water policy, known as the Water Framework Directive (WFD), approved over two decades ago.

To comply with the stipulations of the WFD, the river basin authorities of the European Union (EU) are drafting the third-cycle river basin management plans, which, in Spain, are currently at the public consultation phase¹. The Spanish plans are expected to be approved over the course of 2022. The first of the two previous planning cycles ran from 2010 to 2015, and the second from 2016 to 2021. Therefore, we already have an overview of the results of the application of the WFD and the extent to which the two prior planning cycles managed or failed to achieve their environmental goals. This is this final planning cycle scheduled by the EU to achieve the objectives proposed by the WFD when it was approved in the year 2000. In other words, if the terms of the WFD

are to be fulfilled, by 2027, all of the bodies of water of the EU should have attained a good ecological status in the case of natural water bodies, or good potential in the case of heavily modified water bodies, except in cases in which less rigorous objectives have been set because it has been adequately justified on the basis of the general interest and disproportionate economic and social costs (the concept of “disproportionate cost” is also under discussion in the EU).

The Spanish Government has decided to use some of the Next Generation funds to finance the investments scheduled for the third-cycle river basin management plans in the different river basin districts to achieve the proposed environmental goals. To do so, some of the RTRP funds will be used to implement the WFD and to improve irrigation systems, which is expected to have a clear impact on the quality and quantity of water. The question that arises is whether the RTRP funds will play an important role in the Spanish strategy for the implementation of the WFD to achieve the environmental goals set for 2027. With this in mind, in this brief, we examine the investments in the programmes of measures of the different hydrological plans of Spanish river basins, compared to how the RTRP funds allocated to the water cycle are used².

We also reflect on the obstacles and uncertainties that may hinder the recovery and conservation of aquatic ecosystems. Factors such as climate change or the complexity of the governance of water management that may obstruct or delay the sustainability goals required by the WFD and the use of the RTRP funds.

¹ https://www.miteco.gob.es/es/agua/temas/planificacion-hidrologica/sintesisborradoresplanes_tcm30-528453.pdf

² https://portal.mineco.gob.es/es-es/ministerio/plan_recuperacion/Documents/Plan-de-Recuperacion-Transformacion-Resiliencia.pdf

In the conclusions, we will strive to answer three questions:

- Will the RTRP (i.e., the Next Generation programme) be a tool to drive a paradigm shift in our understanding of the water cycle?
- Will the RTRP funds be a key factor in achieving the environmental goals of the WFD?
- Which obstacles and other problems might jeopardize the execution and success of the RTRP's measures?

1. Introduction

Water is as an essential element for the functioning of ecosystems. If we want to be able to use water as a resource, and that this water is of good quality and lasts over time, first of all, we have to ensure the integrity and functionality of aquatic ecosystems. We also have to achieve a good chemical and quantitative status of groundwaters. A use cannot be sustained if it causes changes in the biodiversity and functionality of aquatic ecosystems. We have to reject the common assumption that, to guarantee certain uses of water, we can sacrifice the integrity of ecosystems. Sooner or later, an unsustainable use of the resource also eventually affects its availability. Resources are finite and subject to various anthropic pressures that affect both their quality and quantity. The climate crisis (IPCC, 2021) and continued loss of biodiversity (IPBES, 2019) may well worsen the current situation of ecosystems and, therefore, policies are needed that promote the rational and sustainable use of resources, and prevent their deterioration.

Currently, as a consequence of humankind's intensive use and increased consumption of water, in some places, the rivers no longer reach the sea. As a result of the melting of the huge masses of frozen fresh water in the Arctic and Antarctic ice caps, the sea level rises a few millimetres each year, with forecasts predicting that, by the end of the twenty-first century, the sea level could rise by over a metre in certain parts of the world. Everything will depend on what happens with greenhouse gas emissions into the atmosphere, and the resulting increase in the average temperature. This global outlook varies greatly in different regions of the planet. In some areas, rivers are carrying more water because of melting ice (but this will end in 5-40 years, depending on the region), while, in others, the glaciers and other water sources have already disappeared, and

drought has become chronic (for instance, in areas with rainfall of 200 litres per square metre per year or less, and most of the water is used for human purposes). In summary, humankind is changing the water cycle as a result of its exploitation of nature, use of fossil fuels and high dependency on water as a resource.

In view of the fact that the outlook for the future is problematic, or at least uncertain, in terms of water resources and quality, in recent years, significant efforts have been made to be more efficient in all the processes encompassed within the water cycle. There are now different technological tools available to make each step of the water cycle more transparent, efficient and fast, to the extent that technology can help solve the problems of water scarcity and pollution. Indeed, all these tools are extremely useful now and in the future, helping us to save water, warning us of imminent floods and rainstorms, preventing pollution or even improving circular economy processes to generate more resources and save energy (for example, turning wastewater treatment plants into biofactories). Improved governance is also expected as a result of action and coordination plans, such as drought plans or the Water Safety Plans spearheaded by the WHO in Europe (WHO, 2021). However, the question remains whether all these measures will be enough and whether we will make it in time.

We may conjecture that a paradigm shift is needed in which, as well as applying all our technological tools to improve the water cycle, we prioritize conserving or recovering the good ecological status of aquatic ecosystems. Such a paradigm shift would require us to close water cycle as much as possible, and for this to be compatible with maintaining the good status of the waters. To do so, it is necessary to ensure sufficient environmental water flows in rivers to enable the biodiversity and ecological functionality to be maintained, including the watercourses that must reach the sea, and the floodwater required to transport the associated sediments (source of nutrients and structure for ecosystems). The hydrological balance between uses, resources and environmental protection is fundamental for ensuring the good status of surface waters (inland, coastal and transition waters), as well as the good quantitative and chemical status of groundwaters, which are valuable reserves of the resource, especially in time of scarcity, sustaining significant areas with insufficient bodies of surface water. We must also bear in mind that groundwater reserves sustain springs and seasonal aquatic ecosystems that have a high degree of

biodiversity and which are extremely vulnerable. This also highlights the importance of forest and river basin management for the sustenance of small rivers and streams, and the course of the water all the way to the sea. In fact, a good proportion of this paradigm shift is already enshrined in a European law that promotes a sustainable water management cycle: the Water Framework Directive (WFD). This law follows the principles of integrated water resources management (IWRM). To identify what we want to achieve and the current situation of the sustainability of the water cycle, we must firstly look at the objectives of IWRM and the state of the implementation of and compliance with the WFD's environmental goals in Spain.

2. Integrated Water Resources Management (IWRM)

The solution to the water resource crisis and the degradation of aquatic ecosystems requires integrated water resources management (IWRM). According to the UN, this entails “the management of the natural resources of a river basin with the aim of controlling and combining the use and conservation of resources, guaranteeing biodiversity, minimizing the degradation of land and aquatic ecosystems, and achieving the management and social objectives agreed by the stakeholders”. Integrated water resources management forms part of the Sustainable Development Goals (SDG) set by the UN in indicator 6.5.1. Some studies have asserted that IWRM can facilitate increases in agricultural yields (13%) and reduce the water footprint (Vallum *et al.*, 2020). As such, it does not compromise economic development.

For many years, several countries have tried to put this concept into practice, making significant achievements in some cases, with well-proven and consolidated methodologies. Great efforts have been made to define environmental flows (also known as ecological flows), which, according to Spanish law, are considered a restriction prior to use, and play a key role in the third-cycle river basin management plans in Spain. Only the use of water for drinking in emergency or exceptional situations takes precedence over the good status of aquatic ecosystems. The problem with integrated water

resources management comes from the way in which it is implemented and, particularly, from the costs it generates, which are not only economic in nature, but also social and political. There are lots of regulations all over the world in this regard. The Next Generation funds aim to make progress in this direction and, therefore, it is necessary to evaluate whether the measures that we plan to take in Europe and Spain with these funds are sufficient and have the potential to facilitate the implementation of IWRM in our river basins.

The unit on which IWRM is based is a river basin (the WFD refers to river basin districts, comprising one or various river basins) as the scope for planning and management. The river basin district contains different aquatic ecosystems (lakes, rivers, reservoirs, wetlands, coastal waters, transition waters, etc.), which have been or will be modified by the changes caused by both humankind and the natural dynamic (cycles of dry and wet years, floods, droughts, etc.). The changes that we predict as a result of climate change and the environmental damage caused by humankind in the Anthropocene epoch (Crutzen and Stoermer, 2000) are now the biggest concern with respect to the future. Europe's water policy, within the framework of the European Green Deal,³ aims to tackle this problem through the sustainable management of resources. Among other initiatives, the Next Generation funds may make an important contribution towards achieving these goals. Another key part of IWRM concerns governance, and how and by whom the plans will be executed. Although there are well-defined lines of work and scheduled investments, the way the Administration functions often needs time to adapt and change the ways of working acquired over the course of decades. This can precisely be seen by the slow speed of decision-making and the lack of agility in response to changes. The Spanish Administration remains a slow machine in which the administrative processes imposed and the caution taken in decision-making hinder swift action to resolve problems.

The social perception of the importance of what IWRM, is and means, and paradigm shift it entails (with the emphasis on sustainability and not on the resource) is very low. Many of the changes required at a regional and local level get bogged down in this limited version of managing water as a resource. The public is not aware of the changes being driven forward by Europe, and

³ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_es

European legislation is often seen by the different stakeholders as an obstacle to reaching their individual objectives. In fact, European regulations have commonly been considered a hindrance to economic development because they strive to impose models that are considered unsuitable for countries in southern Europe. Often, people look for a fast, local solution, without taking into account the global contexts and the big social and environmental pacts required to guarantee the sustainability of the resource and the environment. Therefore, a great deal of education is needed to convince the decision-makers and society in general that there is no future unless we embrace a global vision of the water problem. Although public engagement is a reality in the Spanish plans (it is included in all the river basin management plans), the way it has been executed and the manner in which this engagement is stipulated in the plans has caused concern among many stakeholders, as well as constant criticism from many environmental and social organizations because of the scarce attention it has received from the Administration (La Roca *et al.*, 2021).

2.1. Legislation for integrated water resources management (IWRM) in Europe: the Water Framework Directive (WFD)

If the RTRP is intended to improve the state of Spain's waters, it must do so in compliance with the stipulations of the WFD. As mentioned, the WFD is the regulation implemented across the countries of the EU in an attempt to ensure that the water cycle throughout Europe is sustainable over time, in accordance with the principles of IWRM. The WFD places a particular emphasis on achieving objectives, rather than on a detailed approach for doing so. For this reason, it incorporates the concept of the good status of the water body, which encompasses more than just the physicochemical properties of the water or the quality requirements for certain uses, focusing also on achieving sustainability and a good structure and functioning of aquatic ecosystems or other closely related ecosystems (in fresh, brackish and sea waters), a good quantitative status of aquifers (extractions and upwellings similar to the recharge rate) and a good chemical status (with no pollution). Good status is a guarantee of the resource in terms of both quantity and quality, sufficient for human uses while, at the same time, enabling the maintenance

of biodiversity and the functioning of aquatic ecosystems.

As an additional objective, the WFD also incorporates economic sustainability for conserving or attaining the good status of water bodies by recovering the costs of water service as a fundamental tool guaranteeing the financing and support required for the measures to be implemented. Water cost analysis is an essential factor for effective management and it must include both financial (investment, maintenance/exploitation and amortization) and environmental costs (associated with the loss of services due to bad status of water bodies), as well as the resource cost (marginal cost of the inefficient or inappropriate use of water). An overview of the WFD and its goals, as well as its implementation in Spain, can be found on the website of the Ministry of Ecological Transition and the Demographic Challenge (MITECO)⁴.

To give guidance to EU Member States with respect to how to apply the WFD, a scheduled implementation process was envisaged, with three cycles set to culminate in 2027 with all bodies of water in a "good status". As mentioned, the second planning cycle was completed in 2021 and the new river basin management plans (the third and final cycle) are expected to be approved at some point in 2022, to be executed over the period 2022-2027. The implementation of the WFD in Spain to date has not been very successful. Most river basin authorities have not managed to invest more than 50% of the planned amounts in the first- and second-cycle plans, and many water bodies still remain in a bad state. To a large extent, this situation is due to the economic and financial problems over the last few decades and the high degree of oversight of administrative contracting and investment processes. However, it is also largely due to the lack of an effective and decisive change in the execution model that requires compliance with environmental protection directives. The low percentage of planned projects is surprising, with only 10% of the funds scheduled up to 2033 having been executed (Table 1). This set of circumstances has converged and made the paradigm shift proposed by IWRM and the WFD impossible or ineffective, even though this shift is crucial for achieving an effective balance between the use of water as resource and its role as a fundamental element of the functioning of ecosystems.

⁴ <https://www.miteco.gob.es/es/agua/temas/planificacion-hidrologica/marco-del-agua/default.aspx>

The presentation of the third-cycle water management plans in Spain (July 2021) appears to mark a significant change of direction in terms of the management model. For the first time, clearly and for all river basin districts, the objective focuses on reducing or optimizing demand, improving efficiency in the use of the resource and achieving environmental goals. As a whole, the river basin management plans (or hydrological plans) are scheduled to receive 20 billion euros in investment over the next six years (2022-2027) (Table 2). A third of these plans correspond to intra-community river basins managed by the autonomous regional governments, and two thirds are for inter-community river basins, which span more than one Autonomous Community and which are managed by authorities that report directly to the Central Government (hydrographic confederations). A commitment has been made to only use the RTRP funds to finance investments related to the European Green Deal. One example of the shift in the model promoted by the Ministry is the removal from the third-cycle plans of over a hundred new reservoirs included in the first- and second-cycle plans, many of which had not been subject to any clear analysis of their economic, social and environmental viability. This number has been reduced to just 15 in the current third-cycle plans, of which 10 will have to go through the corresponding environmental procedures (i.e., still pending authorization). Therefore, it seems that the model really is striving to drive a paradigm shift; the question is whether it will take effect fast enough and what the RTRP's role will be.

Table 1. Spending on investments scheduled for the period 2015-2033.

	Investment (million euros)
Investments executed in 2019	4.468,19
Measures finalized	1.518,14
Regular measures completed	2.673,16
Measures under way	276,89
Investment to be executed up to 2021	18.057,87
Investment to be executed up to 2033	43.451,55

Source: Miterd.

What is the current situation of the status of water bodies in Europe and Spain after the first two planning cycles? We need to know this information in order to determine the scope of the work that must be done over the next few years and how the RTRP will help to achieve this. Table 2 shows that a big investment is needed over

the coming years and it is crucial to ascertain whether the RTRP funds will constitute a significant contribution towards driving the change. To determine what the current situation is, let's first examine what state our water bodies are in.

Table 2. Investments in the water cycle by MITECO in the 2022-2027 planning cycle. Planned investment (in million euros).

Concept	State Water Administration	Other Agents	Total	%
1. Planning, supervision and management	773,59	389,22	1162,8	5,59
2. Environment objectives	3.117,19	7429,29	10546,47	50,66
3. Flood management and dam security	1.044,48	729,52	1774	8,52
4. Desalination and reuse	730,08	272,09	1002,17	4,81
5. Focus on uses: water supply and irrigation	1.301,37	3840,48	5141,85	24,7
6. Grey infrastructures	976,42	124,69	1101,12	5,29
7. Other investments	43,43	46,48	89,9	0,43
Total	7.986,85	12.831,76	20.818,61	100,00

Source: *El Economista* newspaper (July 2021).

3. Diagnosis: the status of water bodies in Spain and Europe

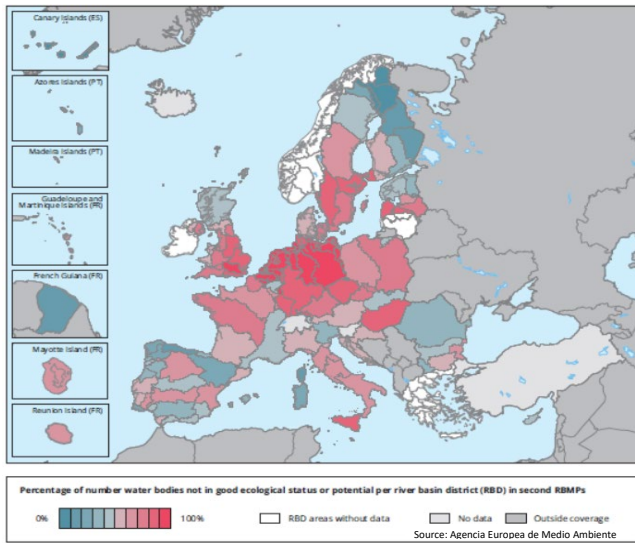
For the purpose of the correct interpretation and application of the WFD, the European Commission approved a Common Implementation Strategy (CIS) which establishes, over time, various working groups and subgroups tasked with resolving or interpreting specific issues related to the WFD. One of these working groups, ECOSTAT⁵, is a WFD implementation committee focusing on specifying working procedures and protocols, and overseeing the intercomparison and calibration between the different states and regions of the EU with respect to their methodologies and databases. In 2018, the European Environmental Agency (EEA) drafted a report with a joint assessment of the water bodies of the EU Member States⁶. The report highlights that, in the 18 years since the WFD was approved, the improvement in the status of the water bodies has been minimal (Figure 1). After 20 years of implementation of the WFD, less than 40% of the surface waters in Europe have achieved good ecological and chemical status, and the goal is to reach almost 100% by the end of 2027.

⁵ A working group created by the European Commission within the Common Implementation Strategy of the Water Framework Directive (2000/60/EC) to develop and draft guidelines with respect to the analysis of the ecological and chemical status of surface and sea waters, and the chemical and quantitative status of groundwaters

(https://ec.europa.eu/environment/water/water-framework/ecological_status_of_surface_waters/index_en.htm)

⁶ "European waters. Assessment of status and pressures 2018". European Environment Agency. DOI: 10.2800/303664 (<https://www.eea.europa.eu/publications/state-of-water>).

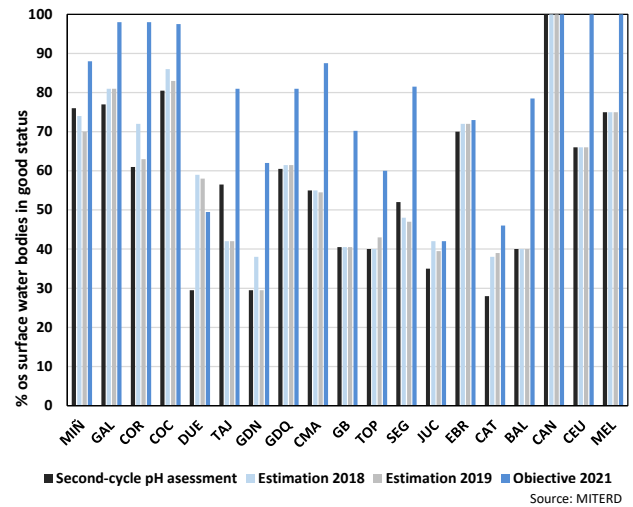
Figure 1. Percentage of water bodies not in good ecological status in European river basins.



It may seem that there are many river basin districts in Spain coloured blue in Figure 1, which would indicate that the situation is relatively good, but this is not really the case. In Spain (inter-community river basins), there are 4,098 water bodies, 68% of which are in a good state⁷. However, in fact, the values range from 30% to 80%, with the Mediterranean river basins ranking lowest (Júcar, internal river basins within Catalonia, Segura), and the wetter regions along the Cantabrian coast and in Galicia ranking highest. In any case, there are many river basin districts that have not studied some of the water bodies contained within them or have not applied certain environmental quality indicators or regulations due to their complexity, resulting in an overestimation in the assessment of the ecological status of many bodies of water. If we look in detail at what has happened in the Spanish river basin districts (Figure 2), we see that none achieved the improvement rates set for water bodies in 2015 (blue bars). Some have fallen very short indeed (for instance, Tajo or Segura; TAJ and SEGA in Figure 2), while others (for example, internal river basins in Catalonia or the River Júcar), which made less optimistic estimates of the results to achieve, made it closer to the target. In either case, they both have a low degree of achievement of the good status of their water bodies and there is still a lot of work to be done. As mentioned, only 10% of the investments planned up to 2033 have so far been executed and, as such, it is hardly surprising that it has not been possible to achieve the objectives set.

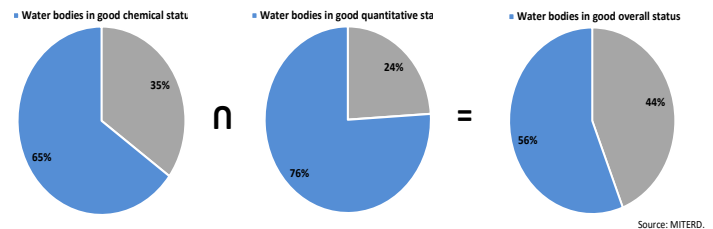
⁷ https://www.miteco.gob.es/es/agua/temas/planificacion-hidrologica/sintesisborradoresplanes_tcm30-528453.pdf

Figure 2. Percentage of surface water bodies in good ecological status in Spain's River Basin Districts.



The status of groundwaters throughout Europe is generally better than in the case of surface waters, but still far below the expected objectives. A total of 74% of groundwater bodies are reported as having good chemical status, and 89% have achieved good quantitative status. In Spain, these figures are 65% and 76%, respectively (Figure 3). In terms of the presence of persistent and priority pollutants, the percentage of surface water bodies in a good status is just 38%. Most cases of non-compliance are due to the presence of mercury, perfluorinated compounds (PFOS) and polybrominated compounds (PBDE) used for industrial and domestic purposes, and some pesticides bioaccumulated in biota and sediments.

Figure 3. Percentage of groundwater bodies in good status in Spain. The target for 2021 was 66.5% (level reached: 56%)



The same report reveals that the main significant pressures on surface water bodies come from hydromorphological alterations (40%), changes to watercourses (weirs, locks, dams) or the channelization of river courses causing a reduction of the flow rate, etc.

Considerable pressure also comes from diffuse sources (38%), particularly from agriculture and atmospheric deposition. In the Mediterranean, the continued dependence on water extraction has risen to 40% of surface and groundwater bodies. This is a complex problem that will require heavy investment, particularly bearing future climate change scenarios in mind.

4. Cost recovery of water services

One of the objectives of the WFD is that the costs of water services are fully or almost completely recovered. The services must be paid for by the users, which is already largely the case in the domestic water cycle, partially thanks to the contribution of European funds (especially for the construction of wastewater treatment plants, WWTP). In Catalonia, the water surcharge enables the recovery of costs for maintenance, replacement and operation of services directly from the majority of users. In the case of agriculture, a significant amount of the service and investment is funded through public subsidies (Common Agricultural Policy, CAP), and users pay a reduced price.

In 2016, the European Commission launched an initiative to identify the economic benefits of the EU's hydrological policy and the costs of not implementing the Water Framework⁸. The conclusions were clear, the good condition of the water masses provide services and well-being. It is therefore necessary to consider investment in the recovery and maintenance of the good condition of water bodies as an essential element in the process of cost recovery and economic sustainability. In Spain, and especially for agricultural uses, this is a complex and controversial issue.

A compilation and detailed review of the information of costs and benefits foreseen in the water management plans made by the European Commission⁹, revealed an excessive diversity of approaches and asymmetrical information depending on the plan consulted. With respect to costs, it was still possible to make a reasonable approximation, using statistical analyses and

aggregating the available cost. In contrast, in the case of benefits, only a very limited number of reliable studies were found. The analysis shows that the lowest levels of cost recovery were detected in the field of agriculture, ranging between 20% and 80%, with an average of 50%. As a result of the high degree of subsidization and the costs that are not subsequently recovered, the price paid by the user was lower than the level required to recover the costs and make this use sustainable over time¹⁰. In the case of the Catalonia river basin district the degree of cost recovery for water services is calculated to be 79%¹¹. With respect to the urban water cycle, the recovery level is 77%, as many of the maintenance and replacement costs for sewage systems in many municipalities are not completely recovered. In the case of industrial uses of water, the recovery rate is 86%, compared to 67% for agricultural uses. The overall cost recovery levels for water services in all Spanish river basin districts as a whole, comparing data from 2015 and 2018, is shown in Table 3. As can be observed, neither has the WFD achieved the expected success in this area. This highlights one of the main obstacles to generating a real, effective paradigm shift: the costs of the water cycle must be recovered, also taking into account the environmental services and costs, in order to achieve efficient and sustainable water management. The table shows that the percentage of cost recovery has increased, but remains below the desired levels. We also wonder whether the RTRP funds will manage to increase and reach an efficient level of cost recovery in relation to water services, or rather we will continue to depend on subsidies or badly funded policies (for both investments and maintenance and replacement costs), while our water bodies remain in a bad state.

Table 3. Water service cost recovery.

Services (for water uses)	% cost-recovery overall in Spanish river basin districts as a whole	
	2015	2018
Urban uses	71,14	71,35
Irrigation/Livestock/Agriculture	63,31	66,1
Industrial uses	72,34	75,53
Total	69,09	71,89

Source: Drafted by authors based on reports and summaries of the different river basin district plans published on the MITERD website.

⁸ https://ec.europa.eu/environment/water/water-framework/call_for_evidence.htm

⁹ Gloria De Paoli, Verena Mattheiß and Pierre Strosser (ACTeon). *Comparative study of pressures and measures in the major river basin management plans in the EU Task 4 b: Costs & Benefits of WFD implementation. Guidance note on the assessment and reporting of costs and benefits.* September 2012.

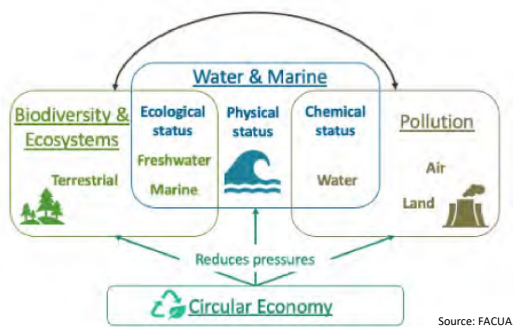
¹⁰ EEA Technical report N° 16/2013. *Assessment of cost recovery through water pricing.* ISSN 1725-2237. DOI: 10.2800/93669.

¹¹ *Pla de gestió del districte de conca fluvial de Catalunya (2022-2027)* offered as public information by the Catalan Water Agency (Official Gazette of the Catalan Government nº. 7301 of 03/02/2017).

5. The Next Generation funds and the Recovery, Transformation and Resilience Plan (RTRP) in Spain: will they play a decisive role in changing the water management model?

The Next Generation funds are an EU financing instrument intended to facilitate working towards a greener community economy that complies with the United Nations' Sustainable Development Goals (SDGs), and is based on the EU's Green Deal. In principle, water is a central part of the EU's strategy, as shown in Figure 4. In the case of water (fresh and sea water), the strategy focuses on goal 3 (The sustainable use and protection of water and marine resources), as well as goals 5 (Pollution prevention and control) and 6 (Protection and restoration of biodiversity and ecosystems). The strategy must also apply the criteria of the *Towards zero pollution in air, water and soil*¹² action plan (May 2021), and the EU's biodiversity strategy for 2030¹³. Aquatic ecosystems are the most polluted and the worst affected in terms of the conservation of species and habitats, with the highest number at risk of extinction.

Figure 4. Environmental objectives of the Next Generation funds



Spain wants to use these funds to boost the recovery of the post-Covid-19 economy, and to drive a change towards the green transition and digital transformation to build, in essence, a different economy that is more environmentally and socially sustainable. The instrument designed to achieve this is the Recovery, Transformation and Resilience Plan or the RTRP,¹⁴ as already mentioned (Figure 5). The RTRP is structured into 4 main pillars and 10 levers, and it assigns lots of investments to the green transition and digital transformation, the circular economy and nature-based solutions (NBS), which form the first two pillars of this

¹² https://ec.europa.eu/environment/strategy/zero-pollution-action-plan_en

¹³ https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en

policy, alongside the other two, social and territorial cohesion, and gender equality. With 30 components in total, this is a complex document, but it sets out an overview of intentions and specifies an investment policy, of which we will gradually discover the details.

With respect to water, the measures to be financed by the RTRP focus on level 2 (Resilient infrastructures and ecosystems), and include components 4 (Conservation and restoration of ecosystems and their biodiversity) and 5 (Preservation of the coastline and water resources), which are directly related (Table 4).

The approach selected by the MITECO (in accordance with the criteria of the European Commission¹⁵) for making investments in the water cycle is through compliance with the Water Framework Directive (WFD) and its daughter directives. The planned grants for the Spanish RTRP amount to almost 70 billion euros, which, in historical terms, is nearly equivalent to all the grants received by Spain from the European Regional Development Fund (ERDF) in its first twenty years as a member of the European Union. In essence, this amounts to doubling the public investment in Spain, up to around 140 billion euros between now and 2026, accounting for around 4% of GDP. This represents a huge injection of capital in the period 2021-2026, which is mostly planned to be executed between 2021 and 2023 through twice-yearly payments from the second semester of 2021 onwards, on the condition of meeting certain milestones and objectives agreed between the Spanish Government and the European Commission.

Figure 5. Structure of the Recovery, Transformation and Resilience Plan (RTRP), showing the four key pillars and the ten levers that it is divided into.



¹⁴ <https://planderecuperacion.gob.es/>

¹⁵ https://ec.europa.eu/info/news/evaluation-eu-water-legislation-concludes-it-broadly-fit-purpose-implementation-needs-speed-2019-dec-12_en

Water-related issues only account for 9% of the funds that will arrive from Europe, and a significant proportion will be allocated to protecting the coastline. The investments in the water cycle within the framework of the RTRP will form part of Component 5, Preservation of the coastline and water resources, which has been allocated an estimated total investment total of 2.091 billion euros¹⁶. This 1.7 billion euros from the RTRP will be assigned to water cycle projects through the third-cycle river basin management plans (2022-2027), with investments in three different areas: 650 million euros on sanitation, water treatment and infrastructure maintenance, 800 million on environmental restoration, and 250 million on digitization. They will not be used for specific measures stipulated in the RTRP, but rather to achieve the objectives of the WFD. Therefore, they are incorporated in the budgets that the river basin authorities will use to reach the WFD goals. Compared to the investments required overall in the Spanish river basins between now and 2033 (43.45155 billion euros), or the unexecuted investments from the second planning cycle (18.05787 billion euros), the amount of 1.7 billion euros is not really a considerable figure. It is similar to the real investments made of the last six years (1.51814 billion euros) according to Table 1. From this perspective, it can be considered significant.

Table 4. Water in the Recovery, Transformation and Resilience Plan (RTRP).

Level 2- Resilient infrastructures and ecosystems
<ul style="list-style-type: none"> • Component 4: Conservation and restoration of ecosystems and their biodiversity. • Component 5: Preservation of coastal space and water resources. • Component 6: Sustainable, safe and connected mobility.
Component 5: River basin planning. Coastal adaptation and protection - 2.091 billion euros (9.5%)
<ul style="list-style-type: none"> • C5.R1 Updating the Water Act, derived regulations, and water-related plans and strategies. • C5.I1 Water treatment, sanitation, efficiency, saving, reuse and infrastructure security. • C5.I2 Monitoring and restoration of river ecosystems, recovery of aquifers and flood risk mitigation. • C5.I3 Digital transition in the water sector. • C5.I4 Adapting the coast to climate change and implementing marine strategies and maritime spatial management plans.

The RTRP also sets out a series of reforms and amendments to the regulations to guarantee a legal framework that promotes increased investment in the European Green Deal. Therefore, it is necessary to review a series of existing plans, regulations and strategies in relation to water (Regulatory reform, component C5.R1). An overhaul of the consolidated text of the Water Act is planned, with a revision of its key

regulations (with respect to planning and ordinance of the public water domain) and other derived legislation, which provides a good opportunity to align the current regulations with the requirements of the Green Deal and SDGs in the field of water management. This is also included in the third-cycle plan, but there is no calendar specified for these reforms, related to digital transformation, in the different river basin districts.

According to data from a recent report by the New Water Culture Foundation (FNCA) (La Roca *et al.*, 2021), everything that has gradually been published about the funds that the RTRP allocates to water is not very specific. The FNCA calculates that the funds clearly defined in the RTRP to be allocated to the water cycle amount to the 2.5 billion euros mentioned earlier. It is expected that other investments will be funded through the RTRP funds in other components yet to be specified in detail (such as digitization of management, supervision and regulation processes, etc.). Neither is it clear how the funds allocated by the RTRP to the Autonomous Communities will be used in the water cycle. For instance, the river basin district management plan for Catalonia (internal river basins) does not specify the use of RTRP funds, simply because, at the time of drafting the proposal for the district management plan, Catalonia did not know what funds it would receive nor what it would allocate them to. The same happens with other funds assigned to local authorities, regional administrations and companies, which may partly be assigned to the water cycle. We will have to wait some time before evaluating the RTRP funds that are eventually invested in the water cycle, but all indications seem to suggest that it will not be much more than the 2.5 billion euros estimated using various approaches.

Some hydrographic confederations have included as an expense to be funded by the 1.7 billion euros of the RTRP the most mature and supposedly most environmental projects of their respective programmes of measures to be executed in the period 2022-2024 (or by 2027 at the latest). Can we ascertain how this 1.7 billion euros will be spent on the different Spanish river basins? We will attempt to analyse this question in the following sections based on different sources.

¹⁶ https://portal.mineco.gob.es/es-es/ministerio/plan_recuperacion/Documents/Plan-de-Recuperacion-Transformacion-Resiliencia.pdf

5.1. The programmes of measures and the Next Generation funds

The Ministry of Ecological Transition and the Demographic Challenge (MITECO) has summarized the large measures designed to achieve the good status of bodies into five broad categories:

- Adaptation to climate change.
- Occasional discharges (especially urban and industrial discharges including from treatment plants, with particular emphasis on emerging contaminants).
- Diffuse pollution (from agriculture: nitrates, pesticides).
- Recovery and restoration of aquatic ecosystems, especially with respect to hydrology and geomorphology, and environmental flows in rivers and upwellings related to aquifers (restoration of the physical processes of the ecosystem: connectivity, ecological flow regimes, restoration of riverbanks, habitats and hydromorphological processes, etc.).
- Sustainable groundwater management.

As can be observed, the third-cycle river basin management plans are designed to give a definite impetus towards improving ecosystems and achieving the good status of water bodies, beyond the levels currently achieved (less than 50%). The river basin management plans have been drafted with this objective in mind and in accordance with the five lines of action described above. In fact, the vast majority of river basin management plans published to date, and which are currently at the public consultation phase, aim to reach thresholds between 80% and 90% of water bodies in a good state by 2027. They aim to achieve this ambitious target through programmes of measures proposed by the water authorities in compliance with the WFD. The programmes of measures specify the investments to be made for each body of water. These lists are very long and it is difficult to find a breakdown of the sources of funding or, in this case, to ascertain whether investments will be financed by the RTRP. Most of the information has been obtained from the MITECO website¹⁷, which is dedicated to hydrological planning¹⁷.

The river basin management plans for the period 2022-2027 (third planning cycle) are undergoing a public consultation process, which has recently been completed in some river basin districts and is being

incorporated in the final plan proposal, while others are still in the final phases of the consultation, pending any objections or arguments that may be lodged during the first few months of 2022. An analysis has been conducted of the different river basin management plans available on the Ministry's website and, with the exception of the plan for the Ebro river basin, none of the plans specify which measures the RTRP funds will be allocated to. The majority of them follow a very similar outline, but they do not refer to the RTRP at any point. They do mention the Next Generation funds, but in a very general way, without specifying. In most cases, the plans state that the hydromorphological restoration measures and the environmental goals may possibly be financed by the funds, but it is not clear how much money from the RTRP they are talking about, nor to which specific measures in the plan the funds will be assigned. A possible explanation for this lack of detail may be that these draft versions were prepared in the first half of 2021, when few details of the RTRP were yet known.

Table 5 integrates the plans for the inter-community river basins (that depend directly on the State) and the data from the internal river basins of Catalonia and the Balearic Islands. The table shows the scheduled investments in the third-cycle plans. The total investment exceeds 24 billion euros, of which 50% are allocated to environmental goals. If we compare the 10.3883 billion euros allocated in the inter-community plans to environmental goals eligible to receive financing from the RTRP funds, to the 1.7 billion euros allocated by the RTRP, we can gauge the importance of these funds with respect to the required investment (1.52 billion euros must be added from the plans of Catalonia and the Balearic Islands allocated to environmental goals).

Table 5. Investments of the third-cycle river basin management plans in different Spanish river basins. State investments, total and allocated to environmental objectives.

	State Water Administration	Total	Environmental Objectives	%
Miño-Sil	206.07	312.26	155.33	49.74
East Cantabrian	151.75	454	257.54	56.73
West Cantabrian	353.09	673.49	478.4	71.03
Duero	659.13	2,742.35	1,991.23	72.61
Tajo	1472	3193	2044	64.02
Guadiana	909.92	1,405.12	930.53	66.22
Guadalquivir	1,771.27	3,762.37	1,992.27	52.95
Segura	1454	2715	223	8.21
Júcar	769.68	1,788.42	656.61	36.71
Ebro	739.9	3,077.50	1,588.90	51.63
Ceuta	18.83	112.1	54.3	48.44
Melilla	47.81	100.29	16.19	16.14
Total	8,553.45	20,335.90	10,388.30	51.08
Catalonia internal ri		2,381.90	862	36.19
Balearic Islands		14.62,17	758	51.84

Source: Drafted by authors based on various sources.

¹⁷ <https://www.miteco.gob.es/es/agua/temas/planificacion-hidrologica/>

To ascertain the amount of RTRP funds assigned to the and water cycle and the type of measures they are allocated to, we will take the example of the Ebro River Basin Plan, which is the only plan found to have enough clarity (annex 12), with a breakdown of which funds will be used to finance each of the measures. The funds are earmarked to be invested in measures to meet the WFD objectives. The Ebro is the biggest river basin on the Iberian Peninsula, and it faces great challenges, with 80% of the resource used for agriculture and, as such, it is sufficiently representative of most large river basins in Spain (and it will spend a total of 1.5889 billion euros on environmental objectives; see Table 5).

Based on the outline of key issues that all water authorities in Europe have to prepare before drafting their respective river basin management plans, the Spanish plans have created various tables to categorize the budget into different areas. One of the summary tables groups the measures into 17 sections (Table 6). This table shows that there are sections aligned with the philosophy of the Next Generation funds, such as sections 4 (Restoration and conservation of the PWD) and 8 (Aquifer recovery), while others do not appear to be directly related (for instance, infrastructures such as desalination plants, or for irrigation). Of course, this will all depend on how these infrastructures are built, what their objectives are, and the role they play in issues such as the recovery of ecological flows in rivers, wetlands, etc. As we can see in Table 6, the Ebro Hydrographic Confederation plans investments in the period 2022-2027 funded by the general State Administration of up to 739.87 million euros, of a total of 3.0775 billion euros to additionally be contributed by other administrations. In contrast, in Table 5, in the Environmental Goals section presented by the Ministry in its summary document, a total of 1.5889 billion euros is allocated to environmental goals in the Ebro. This is due to the fact that environmental objectives include the construction of water treatment plants, which is why the proportion of the total investment that environmental goals account for is always high in the case of all river basins.

Of all these measures, how many will be funded by the RTRP and for how much? Annex 12 of the Ebro River Basin Plan identifies each of the measures financed by the RTRP. Table 6 provides a summary of this information. A total of 52 measures will be financed by the RTRP funds, amounting to over 106 M€, or 14.3% of the State Administration's total investment in the Ebro of 739.87 M€ (sum total of Table 6).

Table 6. Measures of the Ebro Management Plan allocated to achieving the plan's objectives, grouped into the 17 categories specified by MITECO. PWD = Public Water Domain

Group of measures (figures in million euros)	2021	2022	2023	2024	2025	2026	2027	Total 22-27
1. General study/Hydrological planning	0.36	2.42	2.29	2.32	2.27	2.17	2.09	13.93
2. Management and administration of the PWD	0.71	3.91	3.59	3.59	3.59	3.59	3.59	22.56
3. Hydrological monitoring and reporting network	1.46	11.21	11.09	9.01	3.27	3.27	3.27	42.58
4. Restoration and maintenance of the PWD	5.47	11.87	9.17	6.5	2.27	2.27	2.27	39.83
5. Flood risk management	0.35	23.08	22.33	22.33	22.33	22.33	22.33	135.06
6.1. Regulation infrastructures	0	26.12	26.12	26.12	26.12	26.12	26.12	156.72
6.2. Irrigation infrastructures	0	35.44	35.44	35.44	35.44	35.44	35.44	212.63
6.3. Sanitation and water treatment infrastructures	0	4.8	4.8	4.8	4.8	4.8	4.8	28.77
6.4. Water supply infrastructures	0	2.29	2.29	2.29	2.29	2.29	2.29	13.75
6.5. Desalination infrastructures								
6.6. Reuse infrastructures								
6.7. Other infrastructures								
6.8. Maintenance and conservation of water infrastructures	0	5.9	5.9	5.9	5.9	5.9	5.9	35.4
7. Infrastructure security	0.64	6.03	8.62	3.16	2.12	2.12	2.12	24.8
8. Aquifer recovery								
9. Other investments	0	2.26	2.26	2.26	2.26	2.26	2.26	13.55
10. Investment in other institutions' measures	0	0.05	0.05	0.05	0.05	0.05	0.05	0.3
Total	8.98	135.38	133.94	123.76	112.70	112.6	112.52	739.87

Source: Ebro Hydrological Plan.

Which sections of the Ebro programme of measures will be allocated most money from the RTRP funds?

- Section 5 (flood risk management), with investments under the generic title of Morphological Adaptation and Restoration, and of which the Ebro Resilience Strategy also forms part. These measures aim to reduce the risk of flooding through green infrastructures.
- The second section is number 6, with two measures in subsection 6.3 (collectors, stormwater vaults) and in subsection 6.4 (Water supply to small communities).
- Section 4 is also important in terms of investment, as it includes different key restoration measures, such as improving waterways, waterproofing weirs, or Riba-roja sediments, the last of which is a pilot trial primarily requested by the Catalan Government to see how sediments are transported along the course of the river, to try to ensure they reach the Delta.
- Section 7 focuses on emergency plans.
- Section 3 mainly gives an overview of research, such as the studies into the Ebro Delta (sediments, monitoring networks, etc.).

To summarize, the criteria by which these measures have been chosen rather than others are not very clear. Neither is it possible to ascertain that the RTRP funds are allocated to a set of measures that, in themselves, constitute a qualitative change in the river basin plan. Although the measures will facilitate making investments in line with the philosophy of the Next Generation funds, it is surprising how little relevance they are given in the Ebro plan. It is also strange that the plan report makes almost no mention of the Next

Generation funds or the RTRP (perhaps because the plan was drafted prior to the RTRP).

Table 7. Ebro Plan, investments funded by RTRP in each of the different categories in Table 5.

Group of measures	Euros	%	Nº measures	%
1	100,000.00	0.09	1	1.92
2	2,036,270.96	1.91	1	1.92
3	11,722,604.47	10.99	6	11.54
4	23,696,502.16	22.21	22	42.31
5	31,580,603.26	29.60	15	28.85
6	28,522,000.00	26.73	3	5.77
7	9,040,908.00	8.47	4	7.69
Total PRTR	106,698,888.85	100.00	52	100.00
Total Ebro Plan	739,370,000.00	14.43		

Source: Drafted by authors based on the Ebro River Basin Plan.

We can conclude that the RTRP funds will help to finance measures that are already scheduled in the river basin management plans. They will help to guarantee, and hopefully also accelerate, the investment to enable compliance with the WFD sooner and more effectively. Therefore, it is important not to underestimate their usefulness and importance, but they do not constitute a substantial shift in the way in which the water in the river basin is managed. As they currently stand, neither do they represent a decisive change towards achieving the objectives of IWRM. They will contribute towards the paradigm shift, but probably not to a sufficient extent, unless they are equipped with efficient mechanisms for generating a change in water governance. If we compare the 106 million euros to the 1.5889 billion allocated to environmental goals in Table 5, we can see that the percentage is even lower. Of course, we do not know what proportion of the contribution of the other administrations (difference between the total and the general State Administration in Table 5) will be made using grants received from the RTRP funds to achieve the environmental goals. For instance, the Ebro Management Plan does not include the construction or operation of water treatment plans as an investment to be made through the RTRP funds, because such plants fall under the responsibility of the Autonomous Communities. Depending on what the other administrations (Autonomous Communities and local authorities) allocate the RTRP funds to, their relative weight with respect to the overall investment in the water cycle will be more or less relevant.

5.2. Agriculture, water saving and the RTRP funds

In the field of farming, 563 M€ of RTRP funds will be allocated to finance 60 measures to modernize irrigation systems, which, when added to planned private investment, will amount to 700 M€ (IWater, 2021).

These measures will facilitate the modernization of up to 100,000 Ha of irrigated land (around 100 communities of irrigating farmers), According to the Ministry of Agriculture (Planas, 2021, p. 35 to 38). In fact, the RTRP funds will be used to finance modernization projects that were already planned (1 million Ha of irrigated land). Farmers talk openly about the “godsend” of the Next Generation funds (Del Campo, 2021). This corresponds to the investments in the lever “Urban and rural agenda, the fight against depopulation, and agricultural development”, in component 3 “Transformation and digitization of the business community and logistics chain of the agricultural and fishing system”. According to the Ministry, the aim is to modernize the existing irrigation systems by promoting the use of renewable energies and reuse. The first investments for a total of 226 M€ to finance 45 measures will be executed in the period 2021-2022. The remaining 563 M€ will be made in 2022 (or probably later).

It is not made clear whether these investments will constitute an environmental improvement in the water bodies, nor whether they are related to the WFD or the MITECO’s quality objectives. It is not known whether all the water saving obtained by improving irrigation efficiency will be used to irrigate more hectares of land or to improve the quality of the water in the rivers. No reference is made to the potential environmental impact of these modernizations on the ecological flows or the status of water bodies. Therefore, it is crucial that the investments made to modernize irrigation systems are associated with improving the status of water bodies, as required by the WFD.

Based on the experiences to date, the modernization of irrigation systems, which have so far benefitted 2.1 million Ha in Spain, have reduced the flows of rivers fed by irrigation runoff. This counteracts the efforts of the Spanish Government to try to improve the ecological flow in the rivers in the river basin plans (La Roca *et al.*, 2021). Therefore, as the current modernizations carried out to date have had an important impact on water quality, the analysis of these potential impacts must be included in all future modernization projects to guarantee that the policies of the Ministry of Agriculture do not contradict those of the MITECO. Hence, the Spanish Government must establish effective coordination mechanisms between the two Ministries to ensure that both their objectives can be met, as well as complying with the European environmental legislation.

One of the aspects of both the RTRP and EU policy is the coordination between plans and, in the case of

agriculture, between the CAP and the WFD. This coordination does not exist in this case, nor in Europe, as highlighted by a special report of the European Court of Auditors (2021), which emphasizes the lack of coordination between the CAP and the WFD. As the report points out, the majority of CAP funds are not linked to environmental funds, leading to pollution and overexploitation of aquifers. The report also reveals that there is no supervision of water extractions, nor a suitable regime of penalties, with many exemptions removing the obligation to comply with environmental goals or reduce pressures on water bodies. Within such a context, it is by no means certain that the RTRP funds used to modernize irrigation systems will resolve or reduce the environmental impact that extensive farming has on aquatic ecosystems, as explained by other authors (for instance, La Roca *et al.*, 2021). In other words, not only is it necessary to ensure good coordination between the ministries in Spain, but also to bring about a change at a European level to guarantee that the CAP and the WFD objectives do not contradict each other.

To summarize, it is unclear whether the 563 M€ that the RTRP plans to allocate to the modernization of irrigation systems clearly serve to preserve the flora and fauna of aquatic ecosystems, nor protect their biodiversity. Neither do they appear to meet the objectives or even the basic criteria of the European Green Deal. The agricultural authorities at a state level also seem to overlook environmental issues as they fall within the jurisdiction of the MITECO. From the perspective of sustainability and the paradigm shift that we have repeatedly mentioned, it seems that the agricultural authorities of the Spanish Government are at odds with compliance with the SDGs or, at least, there is a lack of any in-depth analysis of these factors and, most importantly, a failure to achieve effective coordination and shared objectives between the two ministries (Agriculture and Environment). This is a governance issue that also filters down to the river basin authorities and it is, without doubt, one of the key factors in improving the status and preservation of aquatic ecosystems in Spain.

5.3. Governance and the RTRP

It is hard to put the WFD into practice in Spain. In Annex 1, there is a summary of the experience of implementing the WFD, for which there is room for substantial improvement. As late as 2008 (with the Hydrological

Planning Technical Guidelines), projects finally began with shared objectives and a similar methodology in all the river basins. However, the environmental goals set for Spanish water bodies in the first two cycles are still far from the level stipulated in the plans, largely because the planned investment commitments have not materialized into real funding (Table 1). The economic crisis has had an impact on this non-compliance, but there is another key issue in the implementation of the WFD that has drastically slowed down the process: governance or, in other words, the way in which we proceed from the planning stage to the management and effective implementation of the measures. The administrative structures and political and economic pressures involved in water management often hinder progress towards achieving the set objectives. Projects take too long to materialize and are sometime bogged down in administrative procedures or subject to political pressures or opposition from stakeholders. This makes it extremely hard to drive forward the paradigm shift towards sustainability that we have discussed throughout this brief.

As these plans are executed (the administrative processing and application of the plans), the lack of social acceptance of some of the measures to be implemented, and the enormous volume of paperwork that has to be analysed still pose a significant obstacle that hampers efforts to achieve the WFD objectives. According to the Ministry, the use of reclaimed water, one of the plans' star initiatives, is actually lower now than at the start of the plans, and this is one of the key focuses of the new plans, which aim to make up for lost time. The barriers that prevent crucial measures being established are almost always due to the fact that there is little or no coordination (or sometimes opposition) between the administrations. In the case of regenerated water, for instance, progress has been slowed by the reluctance of the Ministry of Health, although it seems that an agreement has recently been reached in this regard. The Spanish Government and the governments of the Autonomous Communities often do not see eye to eye because of different political allegiances. Neither is there good coordination between ministries (for example, the Ministry of Agriculture and the MITECO), nor among the directorates general of the ministry itself (planning and quality), or even between the departments or directorates of the autonomous regional governments. The municipalities, county councils, communities of irrigating farmers, etc. form an ecosystem in which competition is more important than

coordination, which has the same effect as it does in ecosystems: the loss of efficiency and environmental degradation.

This situation has reached ridiculous extremes. For example, the internal river basin management plans of Catalonia are systematically rejected by various Spanish autonomous regional governments that have no direct interests in the Catalan river basin. The administrative obstacles compound the regulatory complexity and the judicialization of many issues that end up unresolved because the legal procedures are lengthy and complicated. The technical work and measures that everybody can see are necessary may come to nothing due to a mere semantic disagreement or convoluted administrative procedure. The plans may be in vain depending on how the regulatory and judicial aspects evolve. Unless this problem is resolved, it will be difficult to make fast progress in the execution of the river basin management plans.

What contribution does the RTRP make towards improving the governance of the water cycle? The Next Generation funds will partly be used to finance a far-reaching administrative reform, like the one already under way in the Hydrological Planning Regulations or the planned reform of the Water Act to streamline administration, reduce bureaucracy and facilitate the implementation of the measures and administrative procedures required to achieve the environmental goals. The reform of the Water Act should give the general public a more important role and place greater emphasis on the paradigm shift towards the environmental and economic sustainability stipulated in the WFD, with transparency in terms of the results achieved. For the time being, the reform of the Water Act has not made it any further than good intentions, and we hope that fast progress can be made to draft the necessary amendments.

Public participation processes are a crucial part of good governance. On occasions, the citizens who have participated in these processes feel that they are just for the sake of appearances and that there is no real political will to give citizens the power to make meaningful changes to the programmes of measures. The majority of participants consider it necessary to take action and implement many of the proposed measures. According to the reports of the Water Policy Observatory (OPPA),¹⁸ public participation processes have sometimes created scepticism and mistrust among the public and have not

responded effectively to the doubts generated by the plans.

In conclusion, there is a sensation of a lack of transparency in the proposal and the definition of the measures in many management plans in Spain, which sometimes leads to mistrust. The RTRP funds assigned to improving this aspect do not even amount to 2% of the total. The MITECO's promise to reform the Water Act seems to be a step in the right direction, but we cannot predict the result once the procedures are initiated and pressures are applied by the various lobbies that are sure to get involved. We hope that governance and transparency can be improved in order to achieve the objectives of the European Green Deal, the WFD and the SDGs, and that the European funds can help to streamline the processing and execution of the required measures.

6. Beyond the WFD and the resilience funds: Obstacles to integrated water resources management

While the WFD has proven to be a transformative factor and a way to mobilize environmental funds with clear objectives (the hydrological planning programmes of measures), achieving the main goal of the WFD for 2027 (the good status of water bodies in Europe) seems difficult and it will require a great deal of effort over the coming years. We are a long way from the paradigm shift advocated by IWRM and which the WFD strives to establish. As such, there is a lot of room for improvement.

In the draft versions of the third-cycle management plans, there has not been a complete shift in the paradigm of how water is managed, although progress has undeniably been made with respect to the contents of the previous plans. There are still many obstacles that prevent the objectives of the plans being achieved. The most relevant developments include changes in water management in the farming sector, greater administrative agility in the execution of measures, and more awareness among the general public with respect to the challenges of the future (droughts, water quality, emerging contaminants, microplastics, etc.). In view of all the above, if we want to reach a position in which

¹⁸ <https://fnca.eu/oppa>

Spanish and European water bodies attain good status by 2027, great efforts will be required.

To summarize, these efforts would have to achieve the following results:

- Technically proven plans that take into account all we know about the hydrology, hydromorphology and ecology of aquatic ecosystems, which is a great amount.
- Improved funding of the different measures and, in particular, enforcing compliance with budgetary obligations.
- Greater coordination between administrations, reduced or streamlined administrative procedures and, most importantly, coordination between the measures of the CAP and the WFD (and between the Ministry of Agriculture and the MITECO), which currently often contradict each other.
- Improved governance that, as result, boosts the real and effective participation of citizens in the decision-making process.
- Improved structure and organic composition of water authorities in Spain to adapt them to the challenges of IWRM and the WFD, equipping them with efficient staff to meet the challenges that arise and the high degree of investment required.

It seems obvious what needs to be done and, in general, there is a high degree of consensus, with the exception of certain specific sectors and groups of opinion. In Europe, the legislation and economic contributions of the EU help countries like Spain make much faster progress than we would have expected a few years ago, but the process is still too slow if we consider the objective set by the WFD for 2027. We have to be able to streamline these processes.

Other aspects that require consideration and which may prove to be an obstacle to faster progress towards environmental sustainability goals include the following:

- Climate change. According to the forecasts in most of the plans and for Europe as a whole, runoff will fall by at least 20% in the next few years. Many plans make trade-offs to try to maintain or even increase the current uses, despite the reduction of flow rates and the need to release ecological flows into rivers. Not even the disappearance of the glaciers nor the reduced amount of snow on mountaintops seem to concern many managers, at least enough to make them question the wisdom of increasing water consumption for irrigation. Climate change has been

incorporated into the third-cycle plans (which is certainly a positive step forward), but with no in-depth analysis of its consequences for the future, which often exceed the scope of a river basin management plan (they involve urban planning issues, etc.). Great efforts are needed in this respect. A comprehensive analysis of how to adapt hydrological planning to climate change is provided by Santamarta and Rodríguez Martín (2020), who call for a paradigm shift: "It is a matter of moving from the old logic of concrete to the new environmental intelligence of sustainability; from the old subsidized productivism to the necessary economic rationality; and, most importantly, from short-sighted denialist suicide to the rigorous application principle of prudence in the face of climate change". This analysis would be absolutely crucial in the third-cycle river basin management plans, but it is not included in all of the plans in a clear and, more importantly, specific way. It is unclear how the reductions in water resources will be offset. Some river basin management plans make no mention of mitigation measures to reduce carbon emissions and the relationship between the water cycle and energy consumption, as Gaya has done (2021).

- The link between forests and water runoff and, therefore, the potential loss of the flow volume of rivers and water resources. Forests are often associated with more water in rivers. Increased forestation (cultivated areas and brownfield sites now containing woods) and the rise in tree biomass generates a very large increase in evapotranspiration. This dries out many springs and rivers in Mediterranean regions, with less than 1,000 litres of rainfall per year, compared to the 2,000 litres that can be evaporated and transpired, an aspect investigated by Gallart and Llorens (2021), but which has not been extensively studied in most river basin management plans, nor is there a general awareness of the risk this poses to biodiversity and the reduction of water resources. Recently, a number of studies on this matter have been published (Santamarta and Rodríguez Martín, 2020). However, no measures in this regard can be found in the majority of the management plan, nor any intention to study its effect. Once again, there is a lack of collaboration and coordination between the MITECO and the Ministry Agriculture.
- Risk perception: None of the stakeholders throughout the many aspects of the water cycle appear to warn against the great danger that we are

facing unless we properly evaluate the risk in the short and medium term. If certain assessments of the reduction in rainfall and snowfall prove correct, there will soon be fierce competition for water resources between agriculture, other uses and environmental needs (ecological flows). The consequences of this competition will be rivers drying up and the loss of water quality, as well as the extremely serious associated social and economic problems. A risk assessment is needed with respect to the possibility of a rapid reduction of water resources.

- Governance. The huge investment to be made in the period 2022-2027 to achieve the environmental goals is a serious concern if there is no administration to process the funds in an agile way adapted to the needs of the WFD. There is no clear indication, in general that the water authorities promote the effective participation of the public and the different local and regional management bodies. Public participation sometimes appears to be a box-ticking exercise rather than an authentic attempt to adapt the plans better to the needs of the people and the environment. We do not know whether it will be possible to undertake the huge amount of work and investment required in view of the real capacity to execute the budgets of Spanish river basins in the past (Table 1). It is highly unlikely, by 2027, with the current human resources and the water policies conducted to date, that there will be the capacity to invest over 20 billion euros. Without greater administrative agility or efficient, fast execution mechanisms, it will not be possible. Looking beyond the money granted by the RTRP funds, huge efforts will be required to draft and execute projects and, most importantly, convince the stakeholders that rapid and decisive action is needed if we want to achieve the SDGs, also in terms of our aquatic ecosystems.

7. Conclusions

At the start of this brief, we posed the following questions:

- Will the RTRP (i.e., the Next Generation programme) be a tool to drive a paradigm shift in our understanding of the water cycle?
- Will the RTRP funds be a key factor in achieving the environmental goals of the WFD?

- Which obstacles and other problems might jeopardize the achievement and success of the RTRP's objectives?

The RTRP as a tool to drive a paradigm shift in the water cycle

According to the data we have analysed, the RTRP funds allocated to the water cycle can help to achieve the objectives of the WFD but, a priori, they will not constitute a qualitative change in how water is managed in Spain (a paradigm shift) unless additional measures are taken. While the perception of water as a resource slowly seems to be changing towards the notion of water as a medium, the primary objective of which is to improve and conserve the status of waters (as well as guaranteeing the resources for all the different uses), we have still not achieved fully sustainable management compatible with the good status of water bodies, as required by the WFD. Unless we make this change, it is not possible to implement effective integrated water resources management (IWRM). We have not changed the way we manage water enough to achieve sustainable, efficient and lasting management. There are certainly many aspects of the third-cycle water management plans that indicate a trend towards a paradigm shift, particularly in urban and industrial uses of water, but there is still uncertainty with respect to environmental integration in agricultural and hydroelectric uses of water in many river basins.

The RTRP's contribution to the shift towards sustainability will be modest, taking into account the other sectors and resource needs required for efficient, sustainable water management in Spain. Nevertheless, it is hoped that it will speed up the process by which certain measures are put into practice. Particularly in the case of agriculture, there is a clear risk of running out of water, both in terms of quality and quantity, unless the resource is managed in a way that embraces IWRM and complies with the requirements of the WFD. Certain users and some farming organizations insist on continuing to increase their water consumption as if they did not face an uncertain future as far as the available resources are concerned. In the field of agriculture, users are confident that they can use the RTRP funds to accelerate the construction of infrastructures that can withdraw more water, without adequately analysing their environmental costs. With climate change, their economic and social viability is not assured either if the resources diminish. The RTRP funds invested in agriculture should guarantee the environmental

sustainability required by the European Green Deal. The critical changes that may take place in the future (fast reduction of resources due to climate change, flooding due to the increased intensity of rainfall, and problems caused by recurring droughts) are not sufficiently taken into account when using the RTRP funds. This could prevent Spain from responding rapidly to future challenges with respect to sustainability. In answer to our question, we believe that, as it stands, the RTRP does not seem to be an instrument that will quickly and decisively help to bring about the paradigm shift that the water cycle needs. Additional measures are required, as well as a profound change in the management and governance of water to make it possible.

Are the funds granted sufficient to achieve the environmental goals in relation to water?

As Tables 5 and 6 show, the funds that the RTRP allocates to the water cycle in Spain within component 5 amount to 1.7 billion euros, to which the funds assigned to modernize irrigation systems must be added, to reach a total of 2.5 billion euros. Compared to the over 20 billion euros budgeted in the third-cycle river basin management plans in Spain, the size of these funds is not considerable, but they may have a positive impact in terms of accelerating the execution of different projects that would perhaps otherwise progress more slowly. Moreover, the funds granted by RTRP do not appear to be earmarked for specific measures. In the cases that the funds have to assigned for specific purposes, they are primarily allocated to hydromorphological improvement measures and river restoration. The physical recovery of these spaces is increasingly necessary, and it should be noted that this aspect is included more and more in the third-cycle management plans published by several river basin districts, and that many measures in this respect will largely be financed by the RTRP. This is certainly a positive aspect of the river basin management plans that should be expanded.

Furthermore, as demonstrated above, the investments made with RTRP funds in agriculture, predominantly to modernize irrigation systems, are not conditional on any guarantees in terms of environmental sustainability, and may hinder efforts to achieve the ecological flows treated as a priority for the first time in the MITECO's river basin management plans. The criticisms of this aspect from environmentalist sectors are significant. As seen in the public engagement processes, dialogue between environmentalists and farmers is extremely difficult and, without open dialogue that leads to

common goals, it will be very hard to respond to the challenges of climate change, maintain current uses and expectations, and achieve the goal of the good status of water bodies. We need to find a common understanding to achieve shared interests (the good status of water bodies and efficient and sustainable use of the resource).

Many of the third-cycle river basin management plans do not embrace a clear commitment to the circular economy. Wastewater treatment plants are still seen as open systems and not as biofactories, which should also ensure the maintenance of the ecological flow. In the MITECO's plans, the matter appears to have been left in the hands of the Autonomous Communities, as many environmental aspects do not fall under the remit of the general State Administration, which is another factor that requires effective coordination. We must bear in mind that, in Spain, there are many rivers that originate in a wastewater treatment plant and, as such, the dilution of the effluent is minimal. Therefore, it is very hard to achieve good ecological status in these bodies of water, and considerable efforts are needed for the water bodies that lack plans for all the necessary investment. To be able to achieve these objectives, more RTRP funds should have been allocated to the water cycle.

Which obstacles and other problems might jeopardize the achievement and success of the RTRP's objectives?

Little by little, the Spanish Government is gradually taking steps to change the paradigm of water management, moving from the perception of water as a resource towards seeing it as an environmental asset and a key factor in the sustainability of our future. We hope that the RTRP helps to speed up the pace of this progress. A crucial aspect of this paradigm shift is a far-reaching reform of water administration that enables the acceleration of processing and executing projects, as well as making these projects a more efficient component of the integrated management of the resource. We hope that our leaders see the need for change and that, right from the smallest authorities (town councils) up to the biggest (Autonomous Communities, Provincial Governments, etc.), the MITECO and the Ministry of Agriculture recognize the need for close collaboration between administrations, companies and users in order to fulfil the SDGs. Achieving the environmental goals guarantees our survival as a society based on a sustainable relationship with all the creatures on the planet. With the current way water management is organized in Spain, and its

constant use as a political tool, it will be extremely hard to progress towards efficient, integrated management.

Various documents are gradually clarifying what the RTRP funds will be used for (<https://planderrecuperacion.gob.es/ejecucion/calendar-io-de-proximas-convocatorias>). These documents decisively advocate projects related to Digitization and Sustainable Mobility, but none of them acknowledge the water cycle as a component. Therefore, the RTRP funds allocated to integrated water resources management will not be much more than the grants mentioned in this brief. We are aware that some town councils have requested funding to work on environmental restoration projects related to water, such as the development of greenways along the course of rivers. Unfortunately, the impact of these measures will be to damage riverbank ecosystems even further, with some of the proposed initiatives going in completely the opposite direction to the principles of the WFD. Based on all the above, our conclusion is that the RTRP does not encompass water as a central pillar and it does not seem possible that it will significantly help to drive the paradigm shift that we have shown as an essential factor for sustainable water management.

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Annex 1. Implementation of the WFD in Spain

The WFD scheduled a staged implementation process with three cycles to achieve good status for all bodies of water by 2027. Two of these cycles have already been completed, and the plans for the third and final cycle (2022-2027) should be approved in the first half of 2022. Therefore, we are at a key point in the processes, in view of the fact that the implementation has largely had little success, primarily due to economic and financial problems, and a failure to prioritize the issue and drive the shift in the economic model required by the directives on environmental protection. With the Next Generation funds, it is expected to be possible to implement the programmes of measures (included in the river basin management plans of all European rivers). These measures aim to achieve the objectives of the WFD, which are associated with a change in the development model, because the model used to date has proven incapable of achieving the good status of all the waters of European aquatic ecosystems.

In Spain, the implementation process has progressed at a slower rate than in other countries, largely due to delays in making the decisions required at the start of the transposition of the Directive, and when rolling out the ambitious process required for the effective application of the WFD from the very beginning, because of resistance and reluctance to change the current development model from various lobbies, particularly irrigators, hydroelectric firms and certain companies unwilling to internalize environmental costs. In Spain, the Directive approved in 2000 and which should have been come into force 2003 with its transposition into Spanish law, was not effectively enacted until 2008, with the approval of the Hydrological Planning Regulations and their technical planning instructions. Some very important years were wasted in the beginning, during which Europe prepared and discussed the new water management model, while, in Spain, they tried to combine the model used to date with the new rules that had “come from Europe”, with the excuse that “Spain is different and, in Europe, they do not understand this difference”. As a result, the first river basin management plans in Spain (for the first cycle) were not approved until 2014 (when the Directive stipulated a deadline of 2009), and which still contained a large proportion of the infrastructure measures designed to satisfy the existing demands and the future predications of the water policy of the last century, without incorporating the concept of environmental, economic and social sustainability proposed in the new Directive.

In Catalonia, the implementation of the new Directive was put into practice at the same time as a significant political change in the Catalan Government, which

enabled the Management Plan of the first cycle of the Catalonia River Basin District (2010-2015) to be approved just within the deadline, in 2010, making it the only plan on the whole Iberian Peninsula to be approved in time. This was acknowledged by the Court of Justice of the European Union, which sentenced the Spanish Government for the delay in approving the first-cycle river basin management plans, with the express exception of the Management Plan of the first cycle of the Catalonia River Basin District. In Spain, the process began with “refusal” (this Directive cannot be implemented in Spain because of the differential feature of its climate; in 2000-2003, there were still plans to divert the Ebro to ensure irrigation and development in southern and eastern Spain. After a period of “disbelief and review situation” (2003-2008): the new Spanish Government that came to power after the 2004 elections facilitated a turning point in the water management model, overturning part of the National Hydrological Plan and the diversion of the Ebro, but the changes to be consolidated or undone after the momentum of so many years of civil work and infrastructure plans with no clear analysis of environmental and economic sustainability did not fully come to fruition. This was followed by a period of “resignation”, in which attempts were made to combine the momentum of the development plans of nineteenth century Spain with the new plans proposed by twenty-first century Europe. The first-cycle river basin management plans (2014) contained a considerable proportion of the infrastructures and measures from past plans, which were, to a large extent, completely incompatible with environmental conservation (non-existent ecological flows), and with the prioritization of demands and projects, many of which were not sufficiently economically and environmentally viable. Subsequently, when the European Commission began to insist on the correct implementation of the sustainability principles and criteria of the WFD, Spain reached the “powerlessness” phase, as it became clear how much economic effort was required to reach these objectives within the context of a recession (2008-2012), when there was practically no money to do anything. After two extremely harsh reports by the Commission, criticizing its lack of realism and failure to comply with the plans, Spain has now entered the “acceptance and impetus” phase with respect to the new water management models. However, it faces a clear problem: the failure to renew the structures required to make the new river basin management plans a reality (the hydrographic confederations), most of which are still equipped with a structure unadapted to the new management model, and whose intervention is excessively supervised by the economic and social sectors that have never wanted to abandon the “old-style” form of water management.

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