



Strategic Orientations on Water and Climate Change

EXECUTIVE SUMMARY



GOBIERNO
DE ESPAÑA

MINISTERIO
PARA LA TRANSICIÓN ECOLÓGICA
Y EL RETO DEMOGRÁFICO

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The Strategic Orientations on Water and Climate Change were approved by the Council of Ministers on July 19, 2022 in development of the provisions of article 19.2 of Law 7/2021, of May 20th, on Climate Change and Energy Transition.



Alberche River in the Tagus river basin (Toledo, Castilla-La Mancha)

Need and goals

Article 19.2 of Act 7/2021, of May 20th, on climate change and energy transition, states the need to develop a Water Strategy for Ecological Transition. The goals of such Water Strategy are to be:

- Define the principles and actions to be considered in the planning and management of water in Spain.
- Adapt the existing water management system to the impacts of climate change and increase its resilience, addressing its main environmental, social and economic challenges in this new scenario. Otherwise, it would be impossible to guarantee in the future the population's well-being as well as the sustainability of the productive and energy systems.

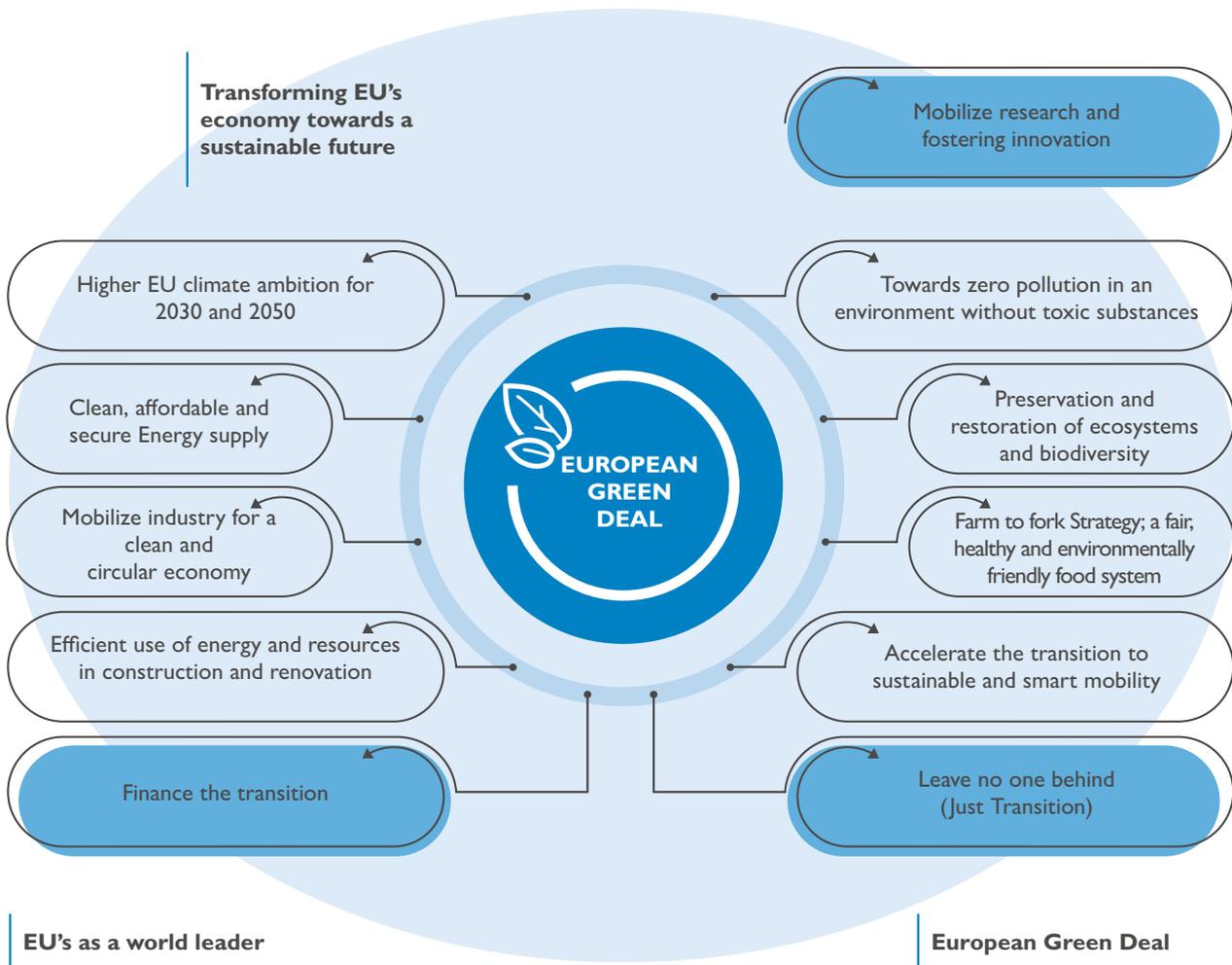
Adaptation to climate change

As highlighted by the Intergovernmental Panel on Climate Change (IPCC), the Mediterranean region is particularly sensitive to the impacts of climate change.

There is a high probability of a decline in water resources, more pronounced in the arid and semi-arid areas of the country, whose river basins are already affected by the main water management problems and the poorest quality of their water bodies. It is worth highlighting out that Spain's already existing extensive endowment of infrastructures leaves little space for new infrastructures to provide the water management system with further adequate resilience. On such grounds, the strategy in those areas must opt for actions to address demand management, efficient use of the resource, the mobilization of non-conventional water resources (reuse and desalination), and the environmental recovery of water bodies.

Spain's Climate Change National Adaptation Plan (PNACC) 2021-2030 constitutes the basic planning instrument to promote coordinated action against the impacts of climate change in Spain, whose Work Program 2021-2025 comprises 24 actions associated with water management and water resources.

Water Policies and Strategies



- ✓ The European Green Deal aspires to achieve “zero pollution in an environment without toxic substances”, both by preventing pollution from being generated and eliminating it where already present in the water environment. To respond to these connected challenges, the European Commission adopted in 2021 a “zero pollution” Action Plan for air, water and soil.
- ✓ EU's Biodiversity Strategy 2030, states the restoration of fluvial continuity of 25,000 km throughout the European Union, of which Spain expects to recover 3,000 km.
- ✓ United Nations' 2030 Agenda for Sustainable Development includes a series of principles and goals to achieve in water planning and management. Goal 6 dedicates to “Ensuring the availability and sustainable management of water and sanitation for all”. In this sense, the 2030 Sustainable Development Strategy, approved by the Council of Ministers in June 2021, defines the roadmap for the accomplishment of the 2030 Agenda in Spain and states among its goals the need to guarantee water security and the attainment of the environmental objectives of the water bodies.

- ✓ The Spanish Circular Economy Strategy establishes a series of objectives to be achieved by 2030, among which is a 10% improvement in water use efficiency.
- ✓ The Climate Change National Adaptation Plan (PNACC) 2021-2030 approved on September 22, 2020 and Order TED/132/2022, of February 21, adopts PNACC's first Working Programme.

Challenges in water management to address climate change

The impacts of climate change on our water management systems and on their related ecosystems are manifest.

- ✓ In Spain, over 2,000 urban settlements with more than 2,000 inhabitants equivalent generate a load of more than 63 million inhabitants equivalent.
- ✓ In recent years, there has been a certain slowdown in investments in sanitation and wastewater treatment. Still, 477 urban settlements do not meet all the EU's required criteria for wastewater treatment.
- ✓ The review of EU's Directive 91/271/ CEE on the treatment of urban wastewater by the European Commission will become an enormous challenge for our country.
- ✓ There is a need for environmental recovery of groundwater bodies as a result of aquifers' overexploitation due to their intensive use. 48% of groundwater bodies are in poor status, 23% in poor quantitative status due to resources' extractions over the renewability threshold, and 35% in poor chemical status.
- ✓ Diffuse pollution by nitrates. The increase in nitrate content skyrocketed in the last two decades of the last century, concurrent with an intensive use of groundwater in some areas. The presence of pesticides in water has become an increasingly important challenge that needs being addressed.
- ✓ The hydromorphological alterations of the rivers have produced significant biodiversity and ecosystem services' loss.
- ✓ For decades, Spain holds a very fragile balance between the water available and the water that agriculture, livestock, industry and households consume.
- ✓ Spain still holds one of the highest Water Exploitation Indices in Europe, aggravated by increasingly frequent droughts.



La Pesga WWTP, Tagus river basin (Cáceres, Extremadura)

Lines to take to overcome the challenges

The main lines to take that Spain's water policy will follow in the coming years are summarized below.

Properly implement EU regulatory framework and policies

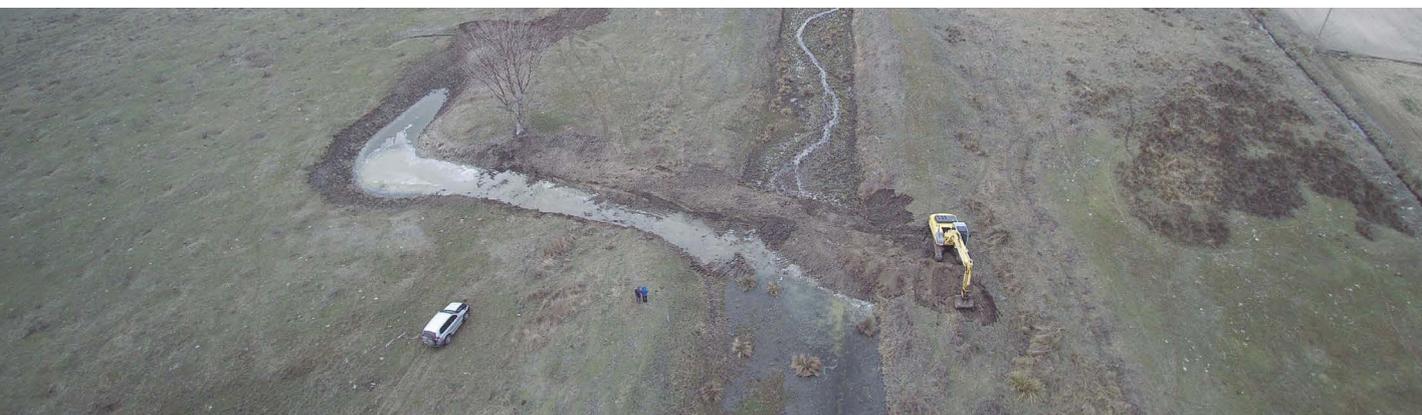
- Directive 2000/60 - Water Framework (WFD).
- Directive 2007/60 on the Assessment and Management of Flood Risks.
- Directive 91/271 concerning Urban Wastewater Treatment.
- Directive 91/676 concerning the protection of waters against pollution caused by nitrates from agricultural sources.
- Directive 2020/2184, on the Quality of Water intended for Human Consumption.
- Royal Legislative Decree 1/2001, of July 20, approving the Consolidated Text of the Water Act and its subsidiary regulations.
- Act 7/2021, of May 20, on Climate Change and Energy Transition.

Foster Water planning in a context of adaptation to climate change

- Initiate the new hydrological planning cycle (2022-2027) in order to achieve the environmental objectives for the water bodies and associated ecosystems, while covering the demands for the different uses, compatible with the good state of the waters, in a context of adaptation to climate change. Such cycle is to be aligned with the Climate Change and Transition Act and will coordinate with the First Work Program of the Climate Change National Adaptation Plan 2021-2030.

Recover, restore and protect rivers, lakes, aquifers and wetlands

- Promote the National River Restoration Strategy (ENRR), with actions aimed at conserving and recovering their good status, minimizing the risks of flooding through proper management of the river domain, the recovery of riverbanks and meanders, and the expansion of river domains through the implementation of nature-based solution projects.
- Launch actions for the recovery of aquifers through the extraction reduction of groundwater by substituting such asset with alternative resources, mainly from reuse and desalination.



Fluvial restoration of the Zapardiel River in the Douro river basin

Enhance water security

- Promote projects that contribute to save and lower water consumption through efficient and rational use of resources, demand reduction and the protection of water bodies and associated ecosystems.
- Foster the expansion of the capacity of existing desalination plants and build new facilities as well as deploy renewable energy projects that contribute to energy efficiency and cost reduction.
- Incorporate circularity actions in the water cycle, by considering treated wastewater as a resource and not as waste, especially for its use in agriculture and in areas that hold major hydric imbalances.
- Develop Integrated Water Systems, which take into account the set of conventional and non-conventional water resources and facilitate the operation of basin authorities, especially in areas with greater hydric imbalances.
- Encourage the use of renewable energies for water production and storage whenever they do not hinder rivers' flow regimes.
- Ensure the safety of the infrastructures, so that they continue to provide service in the proper safety conditions and maintain in full working order the hydraulic infrastructures that comprise the paramount hydraulic heritage of the State's dams and canals.



Fish ladder built by the Ebro Basin Authority | Hijar River (Cantabria)

Foster sanitation, wastewater treatment and reuse

- Promote sanitation and water treatment actions in urban settlements non-compliant with the Waste Water Directive or currently under open infringement procedures by the EC against the Kingdom of Spain.
- Incorporate the latest innovations and technological advances into the treatment facilities in order to adapt to the new requirements that the review of European Wastewater Directive will foreseeably entail.
- Promote specific action plans for small and medium-sized urban settlements, which have greater difficulty in complying with regulatory requirements.
- Establish actions to reduce plastic pollution, seeking solutions that prevent these synthetic materials from reaching the sea.

Fight against diffuse pollution

- Ensure compliance with the regulatory instruments aimed at protecting water bodies from pollution caused by nitrates (Royal Decree 47/2022, of January 18, on the protection of waters against diffuse pollution produced by nitrates from agricultural sources, approved in 2022).
- Implement best practices for the sustainable use of phytosanitary products, promoting integrated pest management and using alternative techniques to phytosanitary products.



2010 Floods in Almodóvar del Río (Córdoba, Andalusia)

Upgrade flood risk management

- Manage flood risks in a coordinated manner, integrating the effects of climate change in risk management and proposing adaptation actions that minimize risks in watersheds, such as natural retention actions, nature-based solutions and green infrastructure.
- Upgrade the hydrological information systems, connecting AEMET's (Spain's Weather Service) weather forecasts with numerical models, real-time information and hazard maps, transmitting information to the involved stakeholders and promoting preparedness for the risk of flooding, key tool to the National Civil Protection System.

Refine drought risk management

- Manage drought risks in a coordinated manner, integrating the effects of climate change in risk management and proposing management actions for these extreme situations in accordance to the drought phase in which the operating systems are in.
- Refine the indicator systems for prolonged drought and scarcity and develop forecast models for these indicators in the short and medium terms.

Recover natural heritage sites

- Implement Mar Menor Lagoon Recovery Action Plan.
- Enhance sediment flow and management in the final stretch of the Ebro River under the aegis of river Ebro's Delta Protection Plan.
- Police actions of the hydraulic public domain in the Doñana Nature Reserve.
- Increase actions of water income and quality improvement in Valencia's Albufera lagoon.
- Implement the Special Plan for the Control and Use of Water in the Area of Influence of the Tablas de Daimiel National Park.

Innovate, research and apply new technologies

- Update monitoring systems for the state and quality of water, developing monitoring warning systems for floods and droughts and improving the information available on the Ministry's web services.
- Refine the digitization of hydraulic infrastructures, incorporating new management tools such as drones or Big Data analysis, which will add to remote sensing and the use of geographic information systems.
- Enhance modelling studies of the hydrological cycle in order to anticipate future scenarios, which will allow proper decision-making.
- Incorporate into the Automatic Hydrological Information Systems (SAIH) the control of the flows supplied to the main water users and connect it with other agencies and entities systems as an input to developing Decision Support Systems (DSS) for the management of spates and floods.

Foster sustainable economic activity

- Promote economic reactivation and employment through investments in water management and its infrastructures under the aegis of the Recovery, Transformation and Resilience Plan (PRTR).
- Support business projects that promote water circularity, savings and efficiency in its use pre-empting nature based solutions and green infrastructures.

Strengthen financing

- Allocate 10,000 million euros in 6 years to water management and its infrastructures from the General State Budget. At least 1,700 million will originate in the Recovery, Transformation and Resilience Plan (PRTR), promoting projects aimed, among others, at the recovery of rivers' aquifers, flood risk mitigation, sanitation, water treatment and reuse, as well as digitization.
- Commit through the FEDER 2021-2027 funding program an estimate of 1,000 million euros investments in water for the next 8 years.



River Dulce River Nature Reserve, Tagus river basin(Guadalajara, Castilla-La Mancha)



Coordination of agents involved in the Ebro Resilience Strategy. Regions of Navarre, La Rioja, Aragón with MITERD and Ebro River Basin Authority

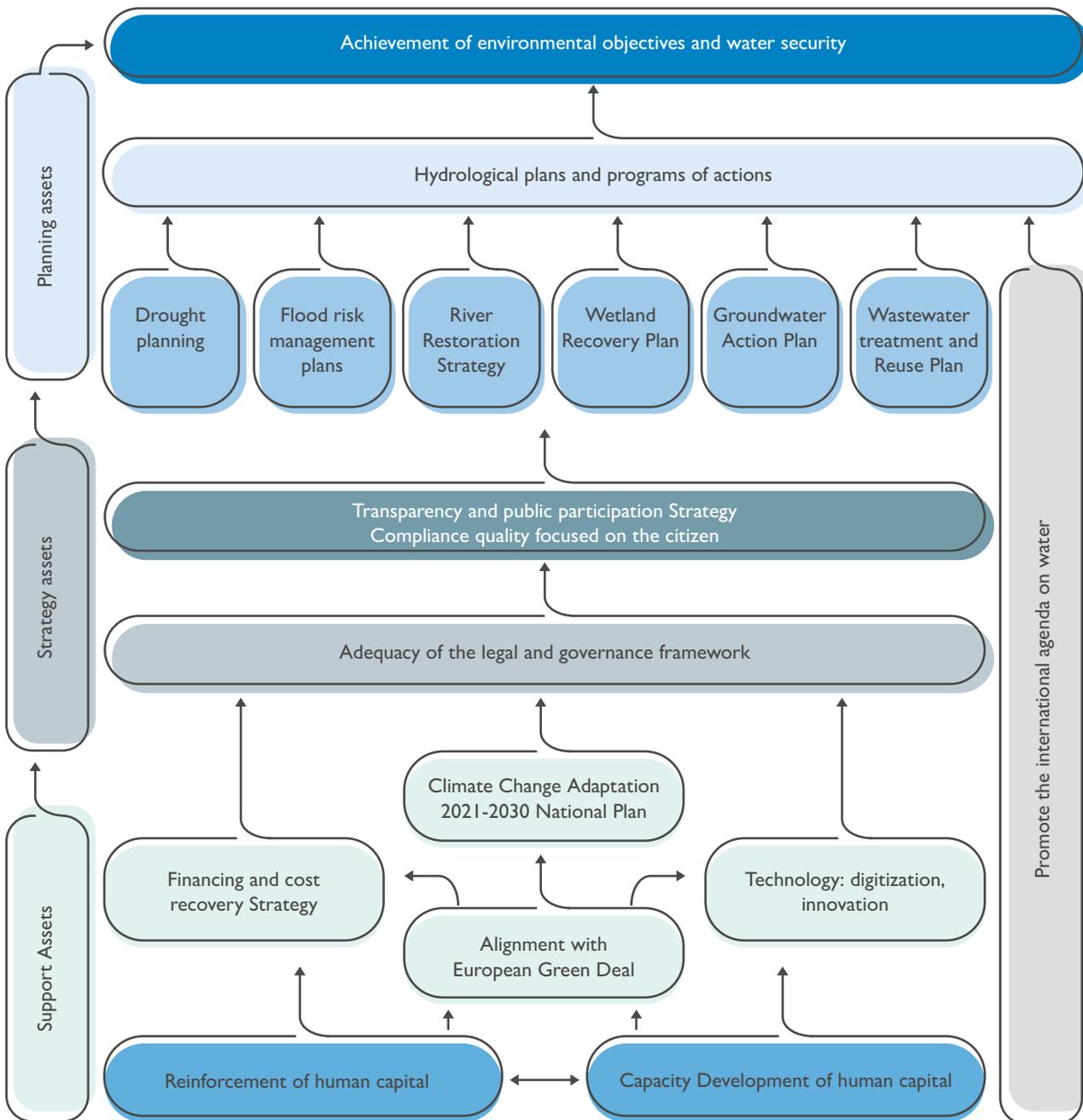
Ensure a transparent, equitable and participatory water governance model.

- Improve coordination between the different government levels and socioeconomic agents for the proper functioning of the urban water cycle.
- Integrate all stakeholders (users, companies and administration), in decision-making and promote the public disclosure of the problems and challenges of water management.

Promote the international agenda on water

- Promote active participation in the multilateral organizations in which Spain is represented, in particular in UNESCO's Intergovernmental Hydrological Program Council, WMO, OECD and collaborating with UN Water's SDG6 Accelerator Framework.
- Consolidate the role of water in adaptation to climate change within the actions resultant from the United Nations Framework Convention on Climate Change, the Paris Agreement, and the Convention for Biological Diversity.
- Promote bilateral cooperation with partner countries, in particular with Morocco, Algeria, France and Italy.
- Continue the regional work programs developed in Ibero-America, by the Permanent Technical Secretariat of the Conference of Water Directors of Ibero-America (CODIA) and in the Mediterranean, through the Mediterranean Network of Basin Organizations (MENBO) and continuing the work program of the Commission for the Application and Development of the Albufeira Convention (CADC).
- Establish a "Spanish Water Partnership" comprising Public Administration institutions, water sector companies' representatives jointly with research centres and universities with the aim of facilitating Spain's presence in the most relevant international water forums.

Instruments of the strategy



INSTRUMENTS, TERMS, IMPACTS AND INVESTMENTS

Instruments	Expected approval date	Main impacts	Estimated Investment (€)
River Basin Management Plans	4Q 2022	Recovery of 1,500 surface water bodies and 300 groundwater bodies (year 2027) Significant improvement in water security in 50 exploitation systems out of a total of 150.	€34,000 M all Public Administrations in Spain of which €10,000 M GSB*
National River Restoration Strategy	4Q 2022	Over 100 river restoration projects 3,000 km of rivers restored (year 2030)	€2,500 M GSB (year 2030)
Flood Risk Management Plans	4Q 2022	Risk reduction for 3 million people through early warning systems, protection against floods and nature-based solutions (year 2027).	€3,600 M Public Administration of which €2,300 M GSB
Special Drought Plans	2Q 2023	Optimize water management during drought periods, minimizing economic, social and environmental impacts	No investment required, these are management measures
Groundwater Action Plans	4Q 2022	Improve monitoring in 400 groundwaterbodies. 1,000 new control points, 250 new protection perimeters and 100 numerical simulation models for groundwater bodies at risk.	€500 M GSB (year 2030)
DSEAR-Purification, Sanitation, Efficiency, Savings and Reuse Plan	Approved July 2021	Make about 400 urban settlements under infringement procedures compliant with the European Wastewater Directive. <i>Governance instrument.</i>	Investments included in RBMPs to an estimate of €3,500 M GSB
PERTE Digitization of the water cycle	Approved March 2022	Improved water use efficiency Digitization of Basin Authorities Digital supply systems in towns 20,000+ Availability of water use information Creation of water cycle observatory 3,500 new jobs	€2,000 M GSB €1,000 M from other Public Administrations and the private sector
Modification of the Water Act and dependant regulations	2Q 2023	Clearer and more structured Water Act text that will solve numerous problems in water management, focusing on environmental protection and water security and seeking a more agile and modern public service. Includes the modification of the financial and economic regimes to increase cost recovery from users	

*) GSB: General State Budgets

Implementation calendar

To develop this Strategy, articulated in the previously described sectoral plans and all of them coordinated with the National Plan for Adaptation to Climate Change, the time horizon is set at 2030, with four significant milestones:

- **Year 2022:** Approvals of the main planning instruments in the field of water: River Basin Management Plans, Flood Risk Management Plans, National River Restoration Strategy and Groundwater Action Plan.
- **Year 2025:** Completion of the first work program of the Work Plan of the National Plan for Adaptation to Climate Change.
- **Year 2027:** Completion of the third cycle of hydrological planning and the second cycle of flood risk planning.
- **Year 2030:** Completion of the horizon of the Strategy and the National Plan for Adaptation to Climate Change.

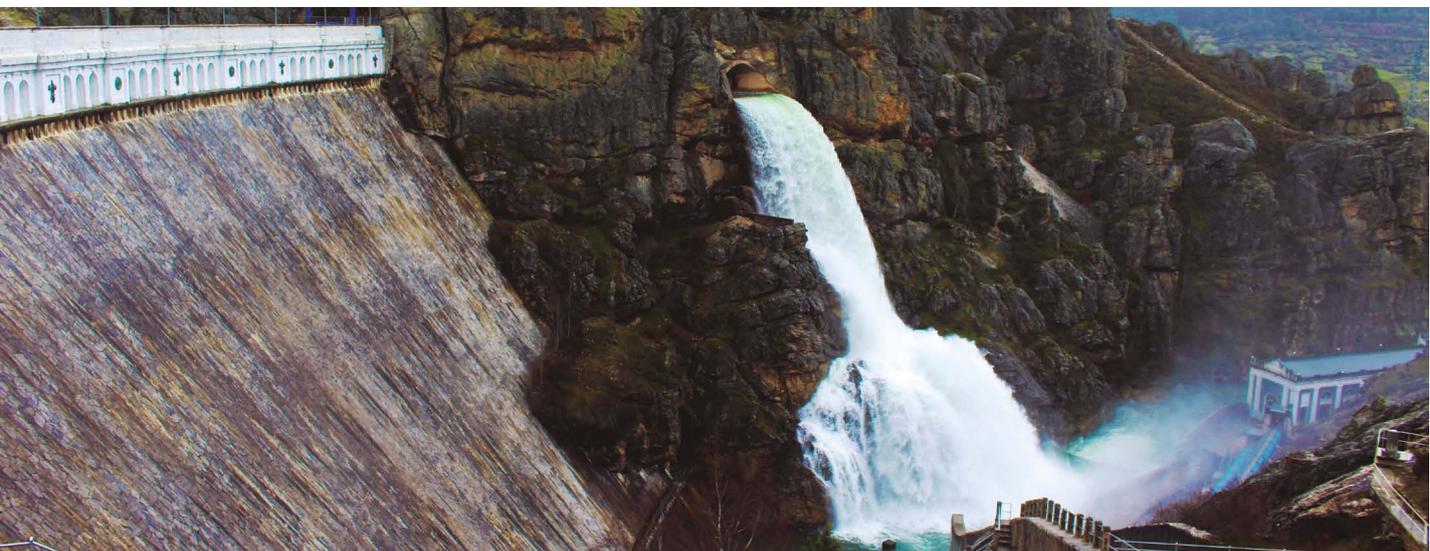
Strategy monitoring indicators

This Strategy aims to guide Spain's water planning and its management in the coming years. Thus, it is essential to provide the Strategy with some metrics that allow checking its performance over time, on how the water management system in Spain aligns to the objectives of the Strategy. To this end, this Strategy includes some monitoring indicators identified regarding the water management objectives.

Most of the indicators are available through the information and data that the Water Administration collects on a daily basis, either to carry out its ordinary water management and planning activities, or to inform the EU as required by the different Directives in the matter.

These indicators are to be accounted for every 3 years since the date of approval of the Strategy, published jointly with a monitoring and risk report. In order to describe the baseline condition, the Water Administration will publish a reference document that will collect the value of these indicators in previous years.

The indicators, grouped by typology, are shown in the following pages.



Camporredondo reservoir, Douro river basin (Palencia, Castilla y León)

MONITORING INDICATORS

No.	Indicator	Source	Unit	Frequency
Climatic				
1	Evolution of Rainfall (Monthly and Annual totals)	AEMET	(mm)	Annual
2	Evolution of temperatures (Monthly and Annual average)	AEMET	Average Temperature (°C)	Annual
Pressure on Water Bodies				
3	Population (Census and Seasonal)	INE	No. of people	Annual
4	Irrigated Surface	MITERD. Annual RBMP monitoring report	Surface (Ha)	Annual
5	Hydropower (Installed Capacity and Outcome)	MITERD. Annual RBMP monitoring report	Capacity (MW) Production (MWh)	Annual
6	Urban, agricultural and industrial consumption	MITERD. Annual RBMP monitoring report	Volume (Hm ³)	Annual
7	2,000+ inhabitants equivalent urban settlements compliant with EU's Wastewater Directive.	MITERD. Directive 91/271 Reports	No. of settlements	Biennial
8	Load treated in urban settlements over 2,000 inhabitants equivalent compliant with EU's Wastewater Directive.	MITERD. Directive 91/271 Reports	Share of load treated in accordance (%)	Biennial
9	Excess nitrogen in soil originated from fertilizer use	MAPA	(Ton/Ha) per year	Annual
10	Registered discharges at the National Discharge Census.	MITERD. CNV annual reports	Number of discharges (units) & Volume(Hm ³)	Annual
11	Share of municipalities or urban settlements with registered discharges at the National Discharge Census.	MITERD. CNV annual reports	Percentage of municipalities or settlements (%)	Annual
12	Registered user permits and volumes at the Water Registry.	MITERD. Water Registry Implementation reports	Number of inscriptions (units) & Volume (Hm ³)	Annual
Protection and improvement of the status of Water Bodies				
13	Share of surface water bodies in good status(global, ecological, chemical)	MITERD. Annual RBMP monitoring report	Percentage (%) by typology	Annual
14	Share of surface water bodies in the river category non-compliant with ecological flow requirements	MITERD. Annual RBMP monitoring report	Percentage (%) by typology	Annual

No.	Indicator	Source	Unit	Frequency
Protection and improvement of the condition of Water Bodies				
15	Share of groundwater bodies in good status (full, quantitative, chemical)	MITERD. Annual RBMP monitoring report	Percentage (%) by typology	Annual
16	Number of groundwater bodies that do not achieve good chemical status due to nitrates or pesticides.	MITERD. Annual RBMP monitoring report	Percentage (%) by typology	Annual
17	Sample points with nitrates or pesticides over the risk thresholds.	MITERD. Environmental Profile of Spain	Percentage (%) by typology	Annual
18	Number of water bodies affected by invasive alien species	MITERD. Annual RBMP monitoring report	Number and Percentage (%) by typology	Annual
19	Number of Hydrological Reserves declared by type (fluvial, lacustrine or underground) and associated area or length.	MITERD. National Catalogue of Hydrological Reserves	Number and area (Ha) or length (km)	Annual
20	Length of restored rivers	MITERD. Environmental Profile of Spain	Restored length (km) and length of connected rivers (km)	Annual
21	Area of restored wetlands	MITERD. Environmental Profile of Spain	Area (Ha)	Annual
Water Security within Integrated Water Resource Management				
22	Reservoir volume for consumptive use	MITERD. Annual RBMP monitoring report	Reservoir volume (Hm ³)	Annual
23	Installed capacity of reversible pumping hydropower systems	MITERD. Annual RBMP monitoring report	Power (MW)	Annual
24	Reused water (Maximum capacity and volume used)	MITERD. Annual RBMP monitoring report	Hm ³	Annual
25	Desalinated water (Maximum capacity and volume used)	MITERD. Annual RBMP monitoring report	Hm ³	Annual
26	Average allocation to urban water use	MITERD. Annual RBMP monitoring report	Hm ³	Annual
27	Upgraded irrigation area	MITERD. Annual RBMP monitoring report	Hm ³	Annual
28	Average allocation to irrigation use	MITERD. Annual RBMP monitoring report	Hm ³	Annual

No.	Indicator	Source	Unit	Frequency
Water security within Integrated Water Resource Management				
29	Estimated population located in preferential flow zones or flood-prone areas	MITERD Annual PGRI follow-up reports	Estimated number of inhabitants	Annual
30	Relevant flood episodes and flood compensations paid by the Insurance Compensation Consortium.	MITERD Annual PGRI follow-up reports	Number & compensation (M€) by Basin district	Annual
31	Length of riverbeds with flood-prone areas mapped in the National Flood-Prone Area Mapping System.	MITERD Annual PGRI follow-up reports	Length of riverbeds (Km) by Basin district	Annual
32	Territorial Scarcity Units in emergency status	MITERD. Annual monitoring Drought Plans report	Number of units	Annual
33	Territorial Drought Units in prolonged drought status	MITERD. Annual monitoring Drought Plan report	Number of units	Annual
Governance				
34	Number of land stewardship agreements	MITERD. Environmental Profile of Spain	Number of agreements	Annual
35	Share of unregistered urban water and losses throughout Spain	MITERD. Drinking water Directive implementation reports	Percentage (%) and associated volume (Hm ³)	Biennial
36	Volume and Share of water by use obtained from volumetric control systems.	MITERD. Implementation reports PERTE Water cycle digitization	Percentage (%) and associated volume (Hm ³)	Annual
37	Number of users and associated volume of water registered at the Water Cycle Observatory web portal by type of concessionaire.	MITERD. Implementation reports	Percentage (%) and associated volume (Hm ³)	Annual
38	Investment in water security actions	MITERD. Annual RBMP monitoring report	Millions of euros (M€)	Annual
39	Investments in sanitation and wastewater treatment	MITERD. Annual RBMP monitoring report	Millions of euros (M€)	Annual
40	Investment in public water domain management actions, water protection and environmental recovery.	MITERD. Annual RBMP monitoring report	Millions of euros (M€)	Annual
41	Share of cost recovery	MITERD. Annual monitoring report RBMP	Percentage (%)	Annual
42	Share of environmental costs in relation to total costs	MITERD. Annual monitoring report RBMP	Percentage (%)	Annual

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