

Basin Risk Indicators - Descriptions, Sources and Links

Risk type	Risk category	#	Risk indicator	Description	Source	Link	
Physical Risk	1. Water Scarcity	1.0	Aridity Index	<p>This data set provides further information about the potential availability of water in regions with low water demand and is used here to improve the risk indications for desert and other arid areas. Aridity is usually expressed as a generalized function of precipitation, temperature and potential evapo-transpiration (PET). An Aridity Index (UNEP, 1997) can be used to quantify precipitation availability over atmospheric water demand.</p> <p>However, in Spain the Ministry of Environment has a national Action Program against Desertification (so called PNAD) where there is a shapefile on Desertification Risk for the whole country.</p>	Ministry of Environment (PNAD)	http://www.mapama.gob.es/es/desarrollo-rural/temas/politica-forestal/desertificacion-restauracion-forestal/lucha-contra-la-desertificacion/lch_pand_descargas.aspx	
		1.1	Annual Extraction Index	Extraction index (so-called in some River Basin Management Plans, RBMPs, from Spain índice de extracción). Ext. index = $100 * (\sum \text{Demandas} / \text{Aportación} - \text{Restricción ambiental})$.	The RBMPs in Spain has specific Annexes in which demands and available resources are collected (e.g. in the Guadalquivir RBMP, this is in Annex 4, Appendix 5)		
		1.2	Baseline Water Stress	See Global Documentation on Indicators, Sources and Description			
		1.3	Blue Water Scarcity	See Global Documentation on Indicators, Sources and Description			
		1.4	Projected Change in Water Discharge	<p>In 2012, the Ministry of Environment in Spain developed a study on the impact of Climate Change over water resources for the whole country. This study has been widely used by the RBMPs in Spain to evaluate the Climate Change impacts for the management strategies for water, so it was considered the most adequate source for assessing the risk for the river basins.</p> <p>This study contains detailed data on different climate change scenarios , and for this indicator, the source chosen was the assessment of the percentage of the average runoff variability in the period 2011-2040 in relation to the control period 1961-1990.</p>	Estudio de los impactos del cambio climático en los recursos hídricos y las masas de agua (Centro de estudios hidrográficos, CEDEX, December 2012) Page 10.	http://www.mapama.gob.es/es/agua/temas/planificacion-hidrologica/ImpactoCCSintesis_tcm7-310167.pdf	
1.5	Estimated Drought Occurrence	<p>In Spain, there is a National Observatory on Droughts, where all the information on drought occurrence can be found. Specifically, there are follow-up assessments for each of the RBs which have more than one Autonomous Community (regional administration division in Spain) within its boundaries.</p> <p>Therefore, most of the Spanish territory is covered by this data.</p> <p>In any case, the data provided by these follow-up reports and the specific maps developed serves as a base for the estimation of the occurrence of droughts in the last two years (2014-2016) and in the last 12 months (September 2015 – September 2016).</p>	Observatorio Nacional de la Sequía	http://www.magrama.gob.es/es/agua/temas/observatorio-nacional-de-la-sequia/			

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		1.6	Projected Change in Drought Occurrence	See Global Documentation on Indicators, Sources and Description		
	2. Flooding	2.1	Estimated Flood Occurrence	At the same time the (2nd) RBMPs were approved, Spain has developed (for most of the RBs) the Flood Risk Management Plans, which include all the information on occurrence of flood episodes and the estimated impacts.	Potential and Significant Flood Risks Areas, ARPSIs (Areas de Riesgo Potencial y Significativo de Inundación) A National level data source on the significant and potential flood risk.	http://www.mapam.a.gob.es/es/cartografia-y-sig/ide/descargas/agua/ARPSIs.aspx
		2.2	Projected Change in Flood Occurrence	See Global Documentation on Indicators, Sources and Description		
	3. Water Quality	3.1	Ecological Status of the Surface Water Bodies	The Ecological Status of the Water Bodies (WBs) as required by the WFD, is an integrated measure of the state of the WBs, measured by a specific set of indicators for each Surface WB' type (River WBs, Lake WBs, Transitional WBs and Coastal WBs). The specific set of indicators is provided by the specific Spanish legislation (Real Decreto 817/2015, de 11 de septiembre, por el que se establecen los criterios de seguimiento y evaluación del estado de las aguas superficiales y las normas de calidad ambiental) and it should be specified in each RBMPs as part of the specific annexes for the assessment of the WBs.	Each RBMP have specific annexes where the assessment of the WBs of each RB is collected.	http://www.mapam.a.gob.es/es/agua/legislacion/
	4. Ecosystem Services Status	4.1	Threat to Freshwater Biodiversity	This indicator reflects the possible impacts on biodiversity of the different pressures over the surface water bodies identified: For surface water bodies the pressures considered and the weightings for the estimation of the risk are: i) Diffuse pollution (0,40) ii) Morphological alterations (0,3) iii) Point-pollution (0,20) iv) Invasive Alien Species present (0,10) The figure of the indicator varies from 1 to 0, and it is estimated as the aggregate value for the different pressures present and corresponding weigh of each.	Each RBMP have specific annexes where the list of pressures over each water body are identified.	
		4.2	Catchment Ecosystem Services Degradation Level	See Global Documentation on Indicators, Sources and Description		
		4.3	Projected Impacts on Freshwater Biodiversity	See Global Documentation on Indicators, Sources and Description		

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Regulatory Risk	5. Enabling Environment	5.1	Water Strategy	This risk indicator tries to answer the question: 'Is there a (good) plan from the government to manage water in a sustainable way?' If government is not very active, water availability and quality might be at risk for businesses. Currently no global research or database is available on this topic. Quality of available information varies greatly across countries and regions.	WWF-ES Assessment	
		5.2	Sophistication and Clarity of Water Related Legal Framework	For the development of this indicator, a study developed by WWF Spain where all Spanish RBMPs were assessed and analysed in detail was used, getting to different levels of sophistication and clarity per basin organism. Currently no global research or database is available on this topic. Quality of available information varies greatly across countries and regions.	WWF-ES Assessment	
		5.3	Implementation Status of Water Management Plans (SDG 6.5.1)	See Global Documentation on Indicators, Sources and Description		
	6. Institutions & Governance	6.1	Corruption Perceptions Index	See Global Documentation on Indicators, Sources and Description		
		6.2	Freedom in the World Index	See Global Documentation on Indicators, Sources and Description		
		6.3	Business Participation in Water Management (SDG 6.5.1)	See Global Documentation on Indicators, Sources and Description		
	7. Management Instruments	7.1	Management Instruments for Water Management (SDG 6.5.1)	See Global Documentation on Indicators, Sources and Description		
		7.2	Groundwater Monitoring Data Availability and Management	See Global Documentation on Indicators, Sources and Description		
		7.3	Density of Runoff Monitoring Stations	See Global Documentation on Indicators, Sources and Description		

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	8. Infrastructure & Finance	8.1	Access to Safe Drinking Water	<p>The Spanish Association of drinking water allocation and sanitation (so-called AEAS in Spain) develops a two-year national poll on water allocation for human consumption and grey-water treatment. This document reflects all the required information to get the data of % of population with access to safe drinking water and sanitation, which are the two indicators considered for the water related risk evaluation. Within the frame of WRF, the last year which has statistics is considered the most updated and the more realistic to be used.</p> <p>The access to safe drinking water and sanitation is commonly not an issue in urbanized areas, but it is for some localized rural areas. To this regard, another study was used as a source of data for this indicator. The Secretariat of State for Territorial Administrations does an Infrastructure and Local Equipment Survey (EIEL). This study is an instrument for quantitative and qualitative analysis of municipal competition services. It is an inventory of national scope which aims to periodically know the status and level of infrastructures and local equipment, in order to assess the needs of these sectors and allow a correct distribution of resources in search of a better planning of the public investments that the Central and Local Administration does in the municipalities.</p> <p>It comprises all municipalities of less than 50,000 inhabitants of the national territory.</p>	The Secretariat of State for Territorial Administrations does an Infrastructure and Local Equipment Survey (EIEL)	http://www.seat.mpr.gob.es/portal/areas/politica_local/coop_econom_local_estado_fondos_europeos/eiel.html
		8.2	Access to Sanitation	<p>The Spanish Association of drinking water allocation and sanitation (so-called AEAS in Spain) develops a two-year national poll on water allocation for human consumption and grey-water treatment. This document reflects all the required information to get the data of % of population with access to safe drinking water and sanitation, which are the two indicators considered for the water related risk evaluation. Within the frame of WRF, the last year which has statistics is considered the most updated and the more realistic to be used.</p> <p>The access to safe drinking water and sanitation is commonly not an issue in urbanized areas, but it is for some localized rural areas. To this regard, another study was used as a source of data for this indicator. The Secretariat of State for Territorial Administrations does an Infrastructure and Local Equipment Survey (EIEL). This study is an instrument for quantitative and qualitative analysis of municipal competition services. It is an inventory of national scope which aims to periodically know the status and level of infrastructures and local equipment, in order to assess the needs of these sectors and allow a correct distribution of resources in search of a better planning of the public investments that the Central and Local Administration does in the municipalities.</p> <p>It comprises all municipalities of less than 50,000 inhabitants of the national territory.</p>	The Secretariat of State for Territorial Administrations does an Infrastructure and Local Equipment Survey (EIEL)	http://www.seat.mpr.gob.es/portal/areas/politica_local/coop_econom_local_estado_fondos_europeos/eiel.html
		8.3	Financing for Water Resource Development and Management (SDG 6.5.1)	See Global Documentation on Indicators, Sources and Description		
Reputational Risk	9. Cultural Importance	9.1	Cultural/Religious Water Roles	In Spain, water is always a relevant issue for society. Anyhow, there is a significant influence on the people from the different RBs (even sub-basins) as a result of the perception of water scarcity. As such, in the basins where water is a very relevant input for local economies (mostly for agriculture) it is commonly perceived as a very scarce resource, given the (usually) high demands and the low and irregular rainfalls (common in many parts of Spain). Given that	WWF-Spain	

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				there is no official database on these matters, the following risk score was proposed by WWF Spain, in an effort to reflect this influence of water scarcity perception.		
	10. Biodiversity Importance	10.1	Freshwater Endemism	See Global Documentation on Indicators, Sources and Description		
		10.2	Freshwater Biodiversity Richness	See Global Documentation on Indicators, Sources and Description		
	11. Media Scrutiny	11.1	National Media Coverage	Indicates how aware local residents typically are of water issues in this specific river basin. The status of the river basin (scarcity, pollution) is taken into account, as well as the importance of water relative to other aspects in life of the local people (like food and shelter security). Given that there is no official database on these matters, the suggested methodology to assess this indicator were the search results from the iAgua platform for each river basin as an estimation. This platform is a Spanish web specifically for water issues, including those mentioned above (scarcity, pollution, food security...) and others like governance or ecosystems and environmental protection.	iAgua	www.iagua.es
		11.2	Global Media Coverage	Indicates how aware people outside the basin typically are of water issues in this specific river basin. Familiarity to and media coverage of the region and regional water related disasters are taken into account. Given that there is no official database on these matters, the suggested methodology to assess this indicator were the search results in Google News for each river basin as an estimation.	Google	www.google.com
	12. Conflict	12.1	Conflict News Events	See Global Documentation on Indicators, Sources and Description		
		12.2	Hydro-political Likelihood	See Global Documentation on Indicators, Sources and Description		