

## 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	The aridity index calculated for the ENA represents the soil surface dynamics determined from the potential evapotranspiration (PET) and the actual evapotranspiration (ET).	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		1.1	Water Depletion	The parameter relates actual available water to total water consumption and is calculated as $(\text{actual available water} - \text{total water consumption}) / \text{actual available water} * 100$ . The parameter ranges between 0 (high water depletion) and 100 (low water depletion). If water consumption is higher than actual available water the parameter was set to zero. Spatial level: River basin, Unit: %.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		1.2	Number of Months with Severe Scarcity	The parameter relates monthly actual available water to monthly water consumption, and it is calculated for each month of the year as follows: $\frac{(\text{actual available water} - \text{total water consumption})}{\text{actual available water}} * 100$ The indicator presents the number of months per year when net water depletion exceeds <60%.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		1.3	Maximum Depletion	The parameter relates monthly actual available water to monthly water consumption, and it is calculated for each month of the year as follows: $\frac{(\text{actual available water} - \text{total water consumption})}{\text{actual available water}} * 100$ The indicator presents the net water depletion in the month in which net water depletion is the highest in the river basin.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		1.4	Projected Change in Water Discharge	This indicator shows the environmental vulnerability of the territory to climate change for a critical scenario in the period between 2071 - 2100, where the temperature is expected to increase by 3.2 °C.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		1.5	Estimated Drought Occurrence	In Colombia, the warm phase of El Niño Southern Oscillation (El Niño) has a great influence in extreme hydrological events like droughts. This indicator is constructed based on the data of average anomalies on river flows for the months December-January-February, for El Niño years between 1950 and 2010 calculated in the ENA.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		1.6	Projected Change in Drought Occurrence	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		

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	2. Flooding	2.1	Estimated Flood Occurrence	In Colombia, the cold phase of El Niño Southern Oscillation (La Niña) has a great influence in extreme hydrological events like floods. This indicator is constructed based on the data of average anomalies on river flows for the months September-October-November, for La Niña years between 1950 and 2010 calculated in the ENA.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		2.2	Projected Change in Flood Occurrence	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
	3. Water Quality	3.1	Water Quality Potential Alteration Index	Water Quality Potential Alteration Index (IACAL in Spanish) of the ENA is a pressure reference on water quality conditions in the country's surface water systems, based on representative variables such as: Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Nitrogen (NT) and Total Phosphorus (PT).	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
	4. Ecosystem Services Status	4.1	Cumulative Threat Index to Freshwater Ecosystem Services (Biodiversity)	This indicator reveals the amount of freshwater biodiversity in relation to the percentage of area of freshwater ecosystems existing in each Hydrographic Subzone.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		4.2	Competition for Green Water	Index of Water Pressure to Ecosystems (IPHE in Spanish) from ENA relates the green water footprint agricultural with the availability of green water. This relationship shows the competition for green water between land use linked to the agricultural sector and the protection areas associated with strategic ecosystems in the basins.	Institute of Hydrology, Meteorology and Environmental Studies - IDEAM. (2019). National Water Study 2014 (in Spanish). Bogotá, D. C. 496 pages.	<a href="http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf">http://documentacion.ideam.gov.co/opendata/bvirtual/023858/ENA_2018.pdf</a>
		4.3	Projected Impacts on Freshwater Biodiversity	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
Regulatory Risk	5. Enabling Environment	5.1	Water Strategy	This indicator takes into account the information obtained from the Plans for Management of Watersheds (POMCA in Spanish).	Regional Autonomous Corporations websites. (2019).	<a href="http://www.asocars.org/2015/index.php/las-car">http://www.asocars.org/2015/index.php/las-car</a>
		5.2	Freshwater Law Status (SDG 6.5.1)	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		5.3	Implementation Status of Water Management Plans (SDG 6.5.1)	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		

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	<b>6. Institutions &amp; Governance</b>	6.1	Corruption Perceptions Index	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		6.2	Freedom in the World Index	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		6.3	Stakeholder Platform	This indicator reveals the existence of a Watershed Council in the basin, based in the update of the POMCA when it corresponds.	Regional Autonomous Corporations websites. (2019).	<a href="http://www.asocars.org/2015/index.php/las-car">http://www.asocars.org/2015/index.php/las-car</a>
	<b>7. Management Instruments</b>	7.1	Management Instruments for Water Management (SDG 6.5.1)	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		7.2	Groundwater Monitoring Data Availability and Management	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		7.3	Density of Runoff Monitoring Stations	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
	<b>8. Infrastructure &amp; Finance</b>	8.1	Access to Safe Drinking Water	This indicator takes into account information of total aqueduct coverage in % at a municipal level. The information is carried at the Hydrographic Subzone level by a weighted spatial average in which the weighting is given by the area percentages of municipalities located within the Hydrographic Subzone.	SIGOT. Superintendent of Home Public Services, 2011.	<a href="http://sigotn.igac.gov.co/sigotn/frames_pagina.aspx">http://sigotn.igac.gov.co/sigotn/frames_pagina.aspx</a>
		8.2	Access to Sanitation	This indicator is based on the percent of sanitation coverage on a municipal level (2011).	SIGOT. Superintendent of Home Public Services, 2011.	<a href="http://sigotn.igac.gov.co/sigotn/frames_pagina.aspx">http://sigotn.igac.gov.co/sigotn/frames_pagina.aspx</a>
		8.3	Financing for Water Resource Development and Management (SDG 6.5.1)	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
<b>Reputational Risk</b>	<b>9. Cultural Importance</b>	9.1	Cultural/Religious Water Roles	It is considered that collective territories give a high importance in their culture and religion to water sources. Thereby, this indicator takes into account information from indigenous reservations and African-American communities as places where the water is considered very important.	Geographic Information System for Planning and Territorial Order (SIGOT in Spanish). Agustín Codazzi Geographic Institute, 2015.	<a href="http://sigotn.igac.gov.co/sigotn/frames_pagina.aspx">http://sigotn.igac.gov.co/sigotn/frames_pagina.aspx</a>

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	<b>10. Biodiversity Importance</b>	<b>10.1</b>	Freshwater Endemism	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		<b>10.2</b>	Freshwater Biodiversity Richness	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
	<b>11. Media Scrutiny</b>	<b>11.1</b>	National Media Coverage	This indicator reveals the possible number of water-related problems in the basin, according to the media.	Google news - Colombia (2019).	<a href="https://news.google.com.co/">https://news.google.com.co/</a>
		<b>11.2</b>	Global Media Coverage	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
	<b>12. Conflict</b>	<b>12.1</b>	Conflict News Events	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		
		<b>12.2</b>	Hydro-political Likelihood	<a href="#">See Global Documentation on Indicators, Sources and Description</a>		