

FS 3.1 Scarcity in the Land of Plenty: Water Risk in Latin America and the Caribbean

Key Takeaways

While Latin America and the Caribbean (LAC) is the most water-rich region in the world, millions of people face water stress problems.

Geographic distribution of water resources in the region does not correspond with the distribution of water demand making it crucial to use people-centric water risk metrics.



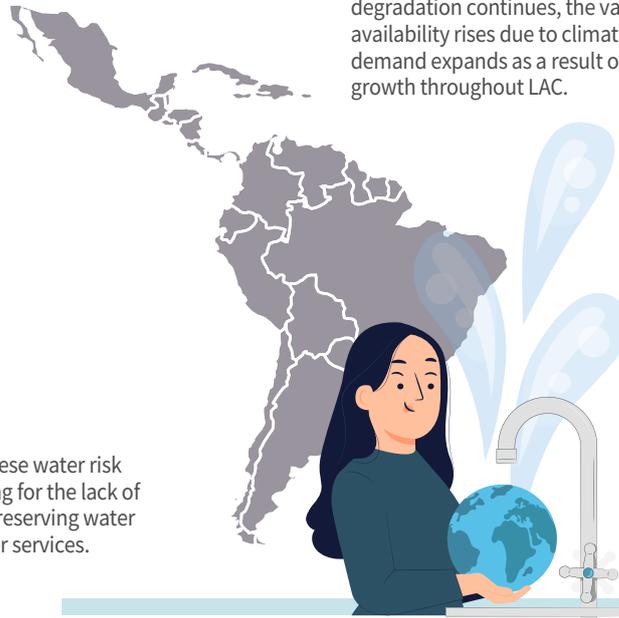
Of the region's population live in areas of **medium-high to extremely high water stress**.



Of the population live in these water risk categories when accounting for the lack of institutional capacity for preserving water quality and providing water services.

Risk promises to increase as infrastructure degradation continues, the variability in water availability rises due to climate change, and demand expands as a result of the urban population growth throughout LAC.

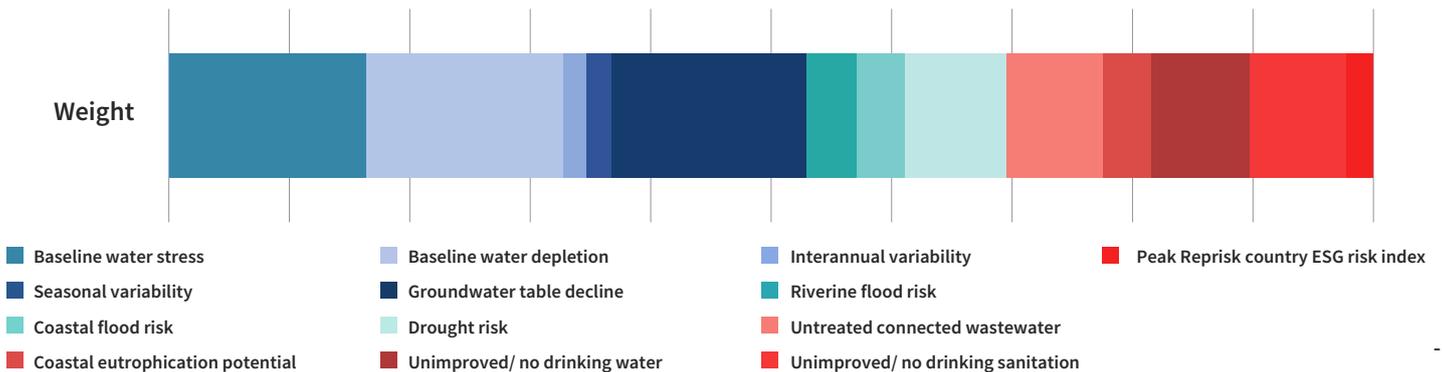
Increased infrastructure investment, integrated water management, and public policies that promote Public-Private Partnerships will be necessary **to reduce water risk in LAC**.



Scarcity in the Land of Plenty

A recent technical note published by the Inter-American Development Bank (IADB) indicates that, although LAC is considered a water-rich region by many metrics, a large percentage of its population is surprisingly vulnerable to water risk. The document, entitled, "Scarcity in the Land of Plenty", uses World Resources Institute (WRI)'s Aqueduct Water Risk framework and disaggregated population data from the WorldPop Project to identify populations living in areas vulnerable to various components of water stress.

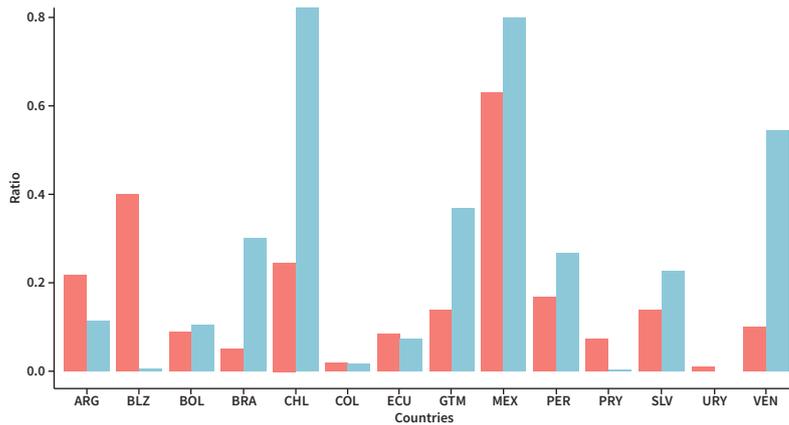
Factors considered in Overall Water Risk (Hofste et al., 2019).



The Importance of People-centric Metrics

LAC is the most water-rich region in the world by most metrics. However, water resource distribution throughout the region does not correspond with the geographic distribution of demand. To sufficiently understand and communicate risk, it is crucial to focus on population-based metrics that account for the multidimensional complexity of water risk. The population-based water risk data analyzed in the IADB report, allows one to explore the population living under various components of water risk, such as water stress, seasonal variability, water quality risk, and overall water risk.

Water risk measures strongly differ depending on whether they are land-based or population-based.



Source: Authors estimates using data from the WRI's Aqueduct 3.0 Water Risk Framework, the WorldPop project, and the Database of Global Administrative Areas (GADM).

Notes: The figure shows a comparison of ratios of land area vs populations living in areas where total water withdrawals are at least 20% of available renewable surface and groundwater supplies. LAC countries with total withdrawals below this level are not represented in the figure.

Regional Variation Leads to Challenges

Water resource distribution throughout LAC is highly heterogeneous geographically as well as temporally, strongly contributing to water risk. This heterogeneity generates certain challenges in terms of water management as water systems need to be robust enough to accommodate extreme events such as periods of droughts, which imply relying on secondary sources of water, and periods of flooding, which put pressure on regular stormwater systems and pollute freshwater supplies. The challenges posed by disperse geographic distribution of water resources and seasonal variation underscore the importance of investment to improve the resilience of existing water systems. A population-centric approach shows that, despite having abundant water resources, a large portion of the LAC population lives in areas prone to water scarcity. Approximately 35% of the region's population live in areas where total water withdrawals are at least 20% of available renewable surface and groundwater supplies, while over half of the population (52.5%) live in areas experiencing medium-high to extremely high water risk as defined by WRI.

Institutional Shortcomings

Water management and regulation play an important role in water risk due to its impact on service provision and water quality. Examining population with respect to a water quality index, consisting of the level of untreated connected wastewater and coastal eutrophication potential, and reputational risk, the population living under water risk increases to 60% of the LAC population. One of the main factors influencing this result is the state of the water distribution and wastewater infrastructure, which is insufficient to meet the needs of a growing population, especially in urban areas.

Category	Population	%
Extremely high (4-5)	22,019,147	3.3%
High (3-4)	224,228,227	33.1%
Medium-high (2-3)	165,369,492	24.4%
Low-medium (1-2)	240,723,127	35.5%
Low (0-1)	25,016,000	3.7%
No data	5,909	0.0%
Total	677,361,900	100.0%

Population living under different categories of Overall Water Risk (Libra et al., 2022).

Investing in Our Water Future

In the coming years, the situation is likely to worsen as climate change, further degradation of infrastructure, and increased urbanization rates put further strain on existing systems. Integrated water resources management combined with revamping of existing infrastructure to reduce water loss and make “last mile” connections will be key, which highlights the need for a substantial increase in investment in the sector. Investments should focus on increasing connections and the adoption of technologies such as Smart Water Infrastructure Technologies (SWIT), which can generate efficiency gains in the water distribution and wastewater systems, or desalination and water reuse technologies, which can increase supply.



PPPs will be crucial to achieve the necessary investments in infrastructure, while improving the quality of public services at a reasonable cost. Only 6% of the private investment in infrastructure in the region is devoted to water and sanitation, indicating that there is great potential to increase the participation of the private sector. However, the current challenging regulatory framework will need to be reformed to attract private investment.

The disaggregated population-based water stress data generated for this study can guide land-use policy and infrastructure investment to promote more resilient populations. The data will be available shortly at www.olasdata.org.

Those interested can read the report at:
<https://publications.iadb.org/en/scarcity-land-plenty>



Sources: 1. Hofste, R. W., Kuzma, S., Walker, S., Sutanudjaja, E. H., Bierkens, M. F. P., Kuijper, M. J. M., Sanchez, M. F., van Beek, R., Wada, Y., Rodríguez, S. G., & Reig, P. (2019). Technical Note. Aqueduct 3.0: Updated Decision-Relevant Global Water Risk Indicators. Washington DC: World Resources Institute. <https://doi.org/10.46830/wri.tn.18.00146>

2. Libra, Collaer, Datshkovsky, Pérez-Urdiales, (2022). Technical Note: Scarcity in the land of plenty, IDB-TN-2411. Washington DC: Inter-American Development Bank. <http://dx.doi.org/10.18235/0003969>



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