

Water, water, everywhere?

The overlooked resource limitation that could slow down Asian industry

A surge in investment inflows

Asia is racing to build the infrastructure of the digital age—semiconductor fabs, hyperscale data centres, AI compute clusters—but the region is doing so on a foundation of increasingly scarce water. While power grids dominate the headlines, water may prove the harder physical limit.

From chip factories to hyperscale data centres all across the region, growing industrial water demand is on a collision course with depleting freshwater systems. Layered beneath this industrial story is a food security crisis in the making: the same river basins and aquifers that industries are drawing on also feed hundreds of millions of people across the region.

A global water system under stress

To fully grasp the scale of the potential crisis, one has to first understand the structural decline of the global freshwater system.

In January 2026, the UN University Institute for Water, Environment and Health published a landmark report declaring the world had entered a state of "water bankruptcy," a condition in which long-term water use exceeds resupply and damages nature so severely that previous levels cannot realistically be restored. Around 70% of major aquifers used for drinking water and irrigation show long-term declines, with the world's largest lakes, rivers and wetlands shrinking in size.

This is not an abstract problem: nearly three-quarters of the global population live in countries classified as water insecure or critically water insecure, and four billion people face acute water stress for at least one month each year. Separate analysis found that by 2050, a third of global GDP could be at risk due to high water stress—water isn't merely an environmental concern, but a systemic economic and investment risk.

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At the Berlin Agriculture Ministers' Conference in January 2026, WTO Deputy Director-General Jean-Marie Paugam warned that global water demand could exceed supply by 40% by 2030 if current water-use practices continue, framing water security as the foundation of food security and, by extension, of global trade stability. This is a wakeup call for industrial planners: the basins they are siting factories and data centres in are among those already in deficit.

Cover image by Rana Kaname

The tech sector's water dependency

Semiconductor fabrication is among the most water-intensive industrial processes on earth, with chip fabs requiring ultrapure water in enormous volumes for wafer cleaning, chemical processing and temperature control.

The industry's water exposure is now a boardroom-level concern. In June 2026, TSMC CEO C.C. Wei publicly acknowledged that water shortage is among the most pressing constraints facing his company. Taiwan's semiconductor industry has long described what executives call the "five shortages"—water, power, labour, land and talent—and Wei's remarks confirm that water remains top of that list.

Taiwan's situation is particularly acute because the island produces the overwhelming majority of the world's most advanced chips—the very chips powering the AI revolution—and does so in a geography that is structurally water-stressed. The island's water supply is heavily dependent on seasonal rainfall and reservoir storage, making it vulnerable to drought cycles. The concentration of global chip supply in a single water-stressed location represents a systemic risk that has received far less attention than the geopolitical risks associated with Taiwan's position.

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The water intensity of chip manufacturing is not confined to Taiwan. Micron Technology's planned US$50 billion Idaho chip factory expansion in the United States has drawn scrutiny over its projected water consumption, with the company remaining silent on where the additional water supply will come from in an already arid region. Thailand and Vietnam are both competing aggressively to attract semiconductor investment, with Thailand's Board of Investment targeting THB2.5 trillion in semiconductor-related investment.

The pattern is consistent: semiconductor investment decisions are being made on the basis of land cost, power availability and workforce access, with water treated as a secondary consideration—or not considered at all.

South Korea's SK Hynix, for instance, has begun investing in river ecosystem restoration near its facilities—joining a public-private effort to revive salmon spawning grounds in Gangwon Province. This signals that at least some chipmakers are beginning to treat local watershed health as a business continuity issue, not merely a corporate social responsibility exercise.



Image by Alex Simpson

Data centres: Asia's new water consumer

The data centre boom sweeping Asia is adding a new and rapidly growing source of water demand to already stressed basins. UN researchers warned in June 2026 that data centres are expected to consume twice as much power and water by 2030 as they expand to meet surging AI demand.

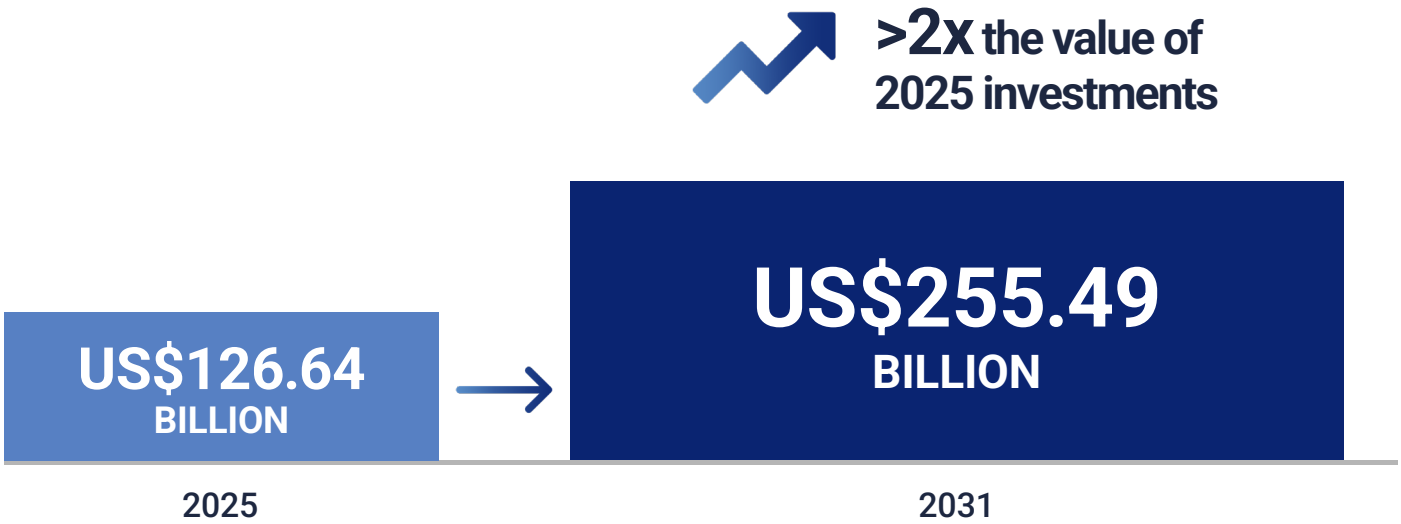
The geography of this expansion is concentrated in precisely the areas where water (and energy) is most constrained. India, for example, has become the primary destination for billions of dollars of investment from Microsoft, Amazon and Google. In Indonesia, AFP was granted rare access to a Microsoft data centre near Jakarta, part of a US$1.7 billion investment with potential hyperscale capacity requiring hundreds of megawatts of electricity. Microsoft projects its water consumption in Indonesia will grow until 2028 before stabilising at 660 million litres per year as the company adds more closed-loop cooling systems.

Data centre capacity in Southeast Asia is projected to triple from 2025 to 2030, driven by a tenfold surge in AI use. Amazon has announced plans to invest more than US$33 billion in cloud computing and AI infrastructure across Southeast Asia through 2039, with commitments focused on Indonesia, Malaysia, Singapore and Thailand.

Australia's data centre boom is facing similar constraints. The country's rapid expansion of digital infrastructure is becoming what one analysis described as a "balancing act" between growth ambitions and the physical limits of energy and water availability—a tension that is playing out across every major market in the Asia-Pacific region.

Singapore's experience—halting data centre development for four years over resource constraints, then resuming under pressure from AI demand—is a preview of the policy dilemma every major Asian economy will face. Long the region's data centre hub, the city state already uses nearly 20% of its national grid to power data centres in 2026 (more than any other nation) and is now exploring nuclear power to meet data centre electricity demand. This is a clear illustration of how the resource constraints of digital infrastructure are beginning to reshape national energy strategy.

Projected investment value of APAC's data centre market



Tech, climate and agriculture collide over water

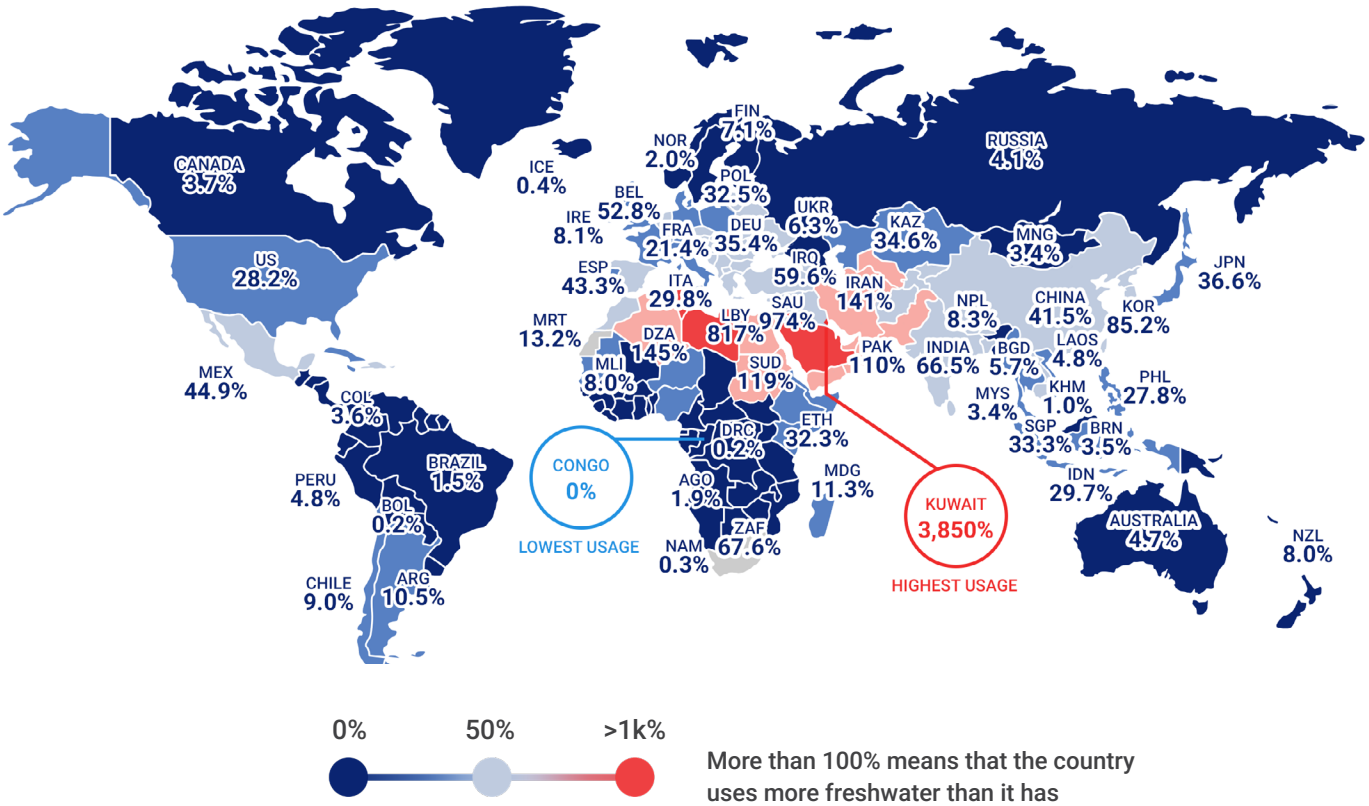
The industrial demand for water does not exist in isolation. Across Asia, the same river systems, aquifers and reservoirs that industry is drawing on are the foundation of agricultural production for hundreds of millions of people. The competition between industrial and agricultural water use is moving from a theoretical concern to an active conflict.

In Bangladesh, the Barind region—transformed over decades by aquifer-fed irrigation into productive farmland—is now facing aquifer collapse. Farmers are struggling to survive as wells run dry, and local voices are warning of potential conflict over water access as the country's water system comes under the combined pressure of the climate crisis and decades of extraction.

A similar situation is playing out in India, the world's largest rice exporter. The rising costs of tapping previous underground water sources and aggressive competition from the data centre sector are intensifying the burdens on local farmers.

In the Mekong River basin, rare earth mining in Laos, Myanmar and Cambodia is poisoning the river's tributaries, raising fears over food safety, shrinking incomes and long-term health risks for communities that depend on the Mekong's fish and rice production. The contamination is transboundary and largely unregulated, adding a pollution dimension to the quantity-based water stress that industrial expansion is creating.

Water stress: Freshwater usage relative to the country's renewable water resources



Source: UN Food and Agriculture Organization

The Mekong basin feeds an estimated 60 million people directly through fisheries and rice cultivation. The convergence of upstream mining contamination, industrial water abstraction and climate-driven flow variability means the basin is facing simultaneous threats to water quality, quantity and seasonal reliability—a combination that no single regulatory framework currently addresses.

The structural water stress facing Asia's industrial and agricultural sectors is being compounded by near-term climate shocks.

In June 2026, the FAO and World Food Programme launched their first-ever Joint Anticipatory Action Appeal, seeking US$202 million to protect 8.8 million people across 22 high-risk countries from the impact of a strengthening El Niño weather pattern. Strong El Niño conditions in the second half of 2026 are predicted to increase the likelihood of drought, floods and storms across parts of Asia and the Pacific, disrupting planting seasons, harvests and water availability. The impacts of this dangerous weather are already visible, as in India, where dangerous heatwaves are stressing water supplies, energy infrastructure and public health.

Indonesia is already experiencing the early effects. As El Niño intensifies, the 2026 dry season has triggered severe water shortages and wildfires, creating what analysts describe as a high-stakes test for the Prabowo administration's food security agenda and climate adaptation policies. The country is simultaneously trying to attract hyperscale data centre investment and manage an agricultural water crisis—two objectives that draw on the same physical resource base.

South Asia is bracing for food shortages as the combination of a potential "super El Niño" and regional geopolitical instability suppresses rainfall and drives up fertiliser costs, threatening harvests across the region. Between 2010 and 2024, 487 water-related disputes were recorded in South Asia alone, and analysts warn that increasing energy demand—including from data centres and industrial expansion—could exacerbate conflicts over rivers and shared water resources.



Image by Nam con nguoi

Pakistan has already escalated its water concerns to the UN Security Council. In June 2026, Pakistan's foreign minister wrote to the UNSC seeking action over India's attempts to alter river flows on the Chenab, warning that the projects threaten Pakistan's water, food and economic security. The letter illustrates how water scarcity is translating into geopolitical tension at the highest levels—a dynamic that will intensify as industrial demand adds new pressure to transboundary river systems.

This is just a preview of the future transformed by climate change, where agricultural, industrial and domestic users all compete for the same shrinking supply at the same time.

The investment risk dimension

Water is beginning to register as a material investment risk in ways it previously did not. The insurance industry has identified water stress as a critical risk for energy and data centre insurers, with projections that a third of global GDP could face high water stress by 2050. For insurers underwriting data centre and industrial assets in Asia, the question of whether a facility's water supply is secure over a 20-year asset life is becoming a standard underwriting consideration.

At the International Finance Forum held in London in May 2026, senior leaders from the global digital infrastructure and investment sectors identified water availability—alongside power access and permitting timelines—as one of the primary determinants of where AI infrastructure can be developed and scaled. The forum's conclusion was that energy and water are no longer simply operational considerations: in many markets, access to reliable water has become one of the primary determinants of infrastructure value, influencing site selection, underwriting decisions and long-term growth strategies.

The US state of Texas provides a useful case study in how this risk is beginning to be quantified. A white paper from the University of Texas at Austin found that data centres could account for 3% to 9% of Texas' water use by 2040, and recommended greater transparency in the industry's water use and better coordination among stakeholders. California has already passed legislation requiring data centres to report how much water they use—the first major regulatory move to treat data centre water consumption as a public resource management issue rather than a private operational matter.

Canada is moving in the opposite direction. Despite growing global scrutiny of data centre water use, Canada is poised to join the data centre boom with little debate about what this will mean for the country's water resources. The absence of regulatory frameworks in many jurisdictions—including across much of Asia—means that water risk is being systematically underpriced in investment decisions.

The technology sector is beginning to respond to water risk through innovation rather than regulation. ZutaCore raised US$100 million in June 2026 to scale waterless liquid cooling technology for AI data centres—a direct market response to the recognition that water-based cooling is becoming a liability in water-stressed locations. If waterless cooling achieves commercial scale, it could materially change the siting calculus for data centres in Asia.

Aligning on a water strategy

The evidence points to a fundamental mispricing of water in Asia's industrial expansion. Semiconductor fabs, data centres, and AI infrastructure are being sited and financed on the assumption that water is an abundant and low-cost input.

The Taskforce on Nature-related Financial Disclosures (TNFD's) finding that 40% of existing semiconductor fabs and more than 40% of those announced since 2021 sit in basins projected to face high or extremely high-water stress by 2030 suggests that this assumption is already wrong for a large share of the industry's existing and planned asset base.

The clean energy transition is adding further pressure, as mining for the critical minerals required for green technologies is depleting water supplies, damaging health and deepening inequality. Lithium mining—a key component for battery technologies—is itself water-intensive, meaning climate-driven water stress could undercut most proposed US lithium mines. The same dynamic applies across Asia's critical mineral supply chains.

For investors and industrial planners, the implication is that water risk needs to be integrated into siting decisions, asset valuations, and supply chain resilience assessments with the same rigour currently applied to power availability and geopolitical risk. At the same time, the most underappreciated risk in Asia's technology investment boom may be that water scarcity does not announce itself gradually—it arrives suddenly, through drought, regulatory restriction or community conflict.

Crucially, the food security dimension cannot be separated from the industrial story. As the UN makes clear, the world has already moved past the point where water stress is a future warning—it is a very real, very near reality.

The question for Asia's industrial future is not whether water will constrain growth, but whether that constraint will be managed proactively. Will stakeholders take action through better siting, technology and governance? Or will they foment reaction through inaction, generating the kind of community conflicts, crop failures and asset stranding that are already beginning to emerge.

The technology exists to reduce water intensity—closed-loop cooling, waterless chip cooling and advanced water recycling—but deployment is lagging behind the pace of industrial expansion. Regulatory frameworks requiring water disclosure and basin-level impact assessment are beginning to emerge in some jurisdictions, but remain absent across most of Asia.

Ultimately, stakeholders across the spectrum need to wake up to the dangers posed by a water scarce future. Far beyond matters of growth, addressing this issue is a matter of life and death, one requiring action and collaboration.

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