Allianz Global Investors

MARCH 2024 | VALUING THE INVISIBLE

Addressing groundwater overuse with sustainable solutions

Groundwater makes up 30% of all freshwater[2] and close to 99% of all liquid freshwater on earth supplying nearly half of all drinking water worldwide[3].

Currently, 70 % of the groundwater extracted globally is used for agricultural products like food, fibres, livestock, and industrial crops – with significantly higher withdrawal levels in arid and semi-arid regions.[4]

Christian Zilien
CFA, Product Specialist
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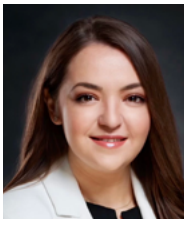

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KEY TAKEAWAYS

- Every year since 1993, the United Nations (UN) has marked World Water Day on 22 March, bringing the significance of freshwater to the centre of public attention.
- This year's World Water Day theme "Leveraging Water for Peace"[1] puts a dedicated focus on how scarce or polluted water, or unequal and limited access to this precious liquid, can spark conflict and how cooperating on water can create a positive ripple effect.
- Safeguarding freshwater resources as a lifeline of our planet also implies preventing groundwater and aquifers from running dry.
- Here, investments in sustainable solutions that focus on managing and restore natural water storage capabilities can help addressing actual and future water-related challenges.

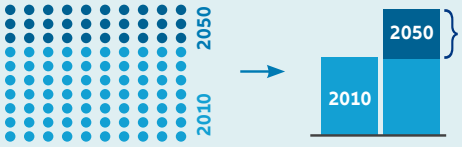
Embracing Disruption

Very large aquifers together account for more than half of the world's groundwater reserves and are the source of approximately 40 % of global groundwater withdrawals[5]. According to a recent scientific analysis, 36% of in total 1,693 examined aquifers worldwide, declined significantly from 2000 to 2022.[6]

Depending on their hydrogeological characteristics some aquifers might only take a decade or even less to recharge whilst other types might need thousands of years.

Given the fragility of groundwater and aquifers as essential components of our planet's hydrological cycle it's crucial to direct investments to more sustainable water treatment, water management and water infrastructure and supply solutions. This will help address the challenges arising from globally accelerating groundwater depletion and can also play an important role in securing food supply to an ever-increasing population with an equally rising water demand and growing energy needs.

The drivers of a growing water demand



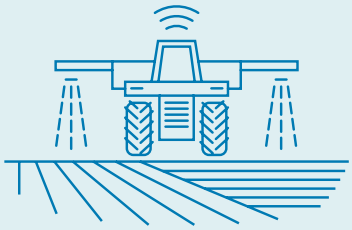
10 billion[a]
global population in 2050

56%[b]
more food needed

By 2045, global urban[e] population will grow by 1.5 times reaching
6 billion

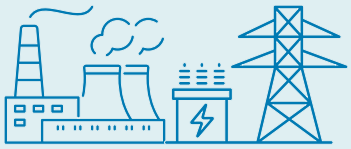
By 2050, a nearly quadrupled[h] world economy is estimated to consume
80% more energy

Global freshwater use by sector



Agriculture
currently uses **70%**[c]
of global freshwater
by 2050 **+19%**[d]

Municipal
to date **~ 11%**[f]
by 2050 **+130%** of domestic use[g]



Industry & energy
to date **19%** by 2050 **+400%**
manufacturing **+140%** thermal electricity generation[i]

[a] World Resources Institute: How to Sustainably Feed 10 Billion People by 2050. December, 2108
[b] Ibid.
[c] Ibid.
[d] Ibid.
[e] Worldbank: Urban development
[f] Our world in data: water-use stress. July, 2018
[g] OECD: Environmental outlook to 2050. April, 2001
[h] Ibid.
[i] Nature.com: Reassessing the projections of the World Water Development Report. July, 2019

Groundwater and aquifers: essential resources under pressure

This is even more imperative as, with advancing climate change and with a higher frequency and longer persistency of droughts, overused aquifers and groundwater reservoirs can no longer serve as reliable buffers that help to mitigate losses in agriculture in arid periods. This, in turn, lowers agriculture's resilience to future droughts, jeopardising global food supply chains and food security.

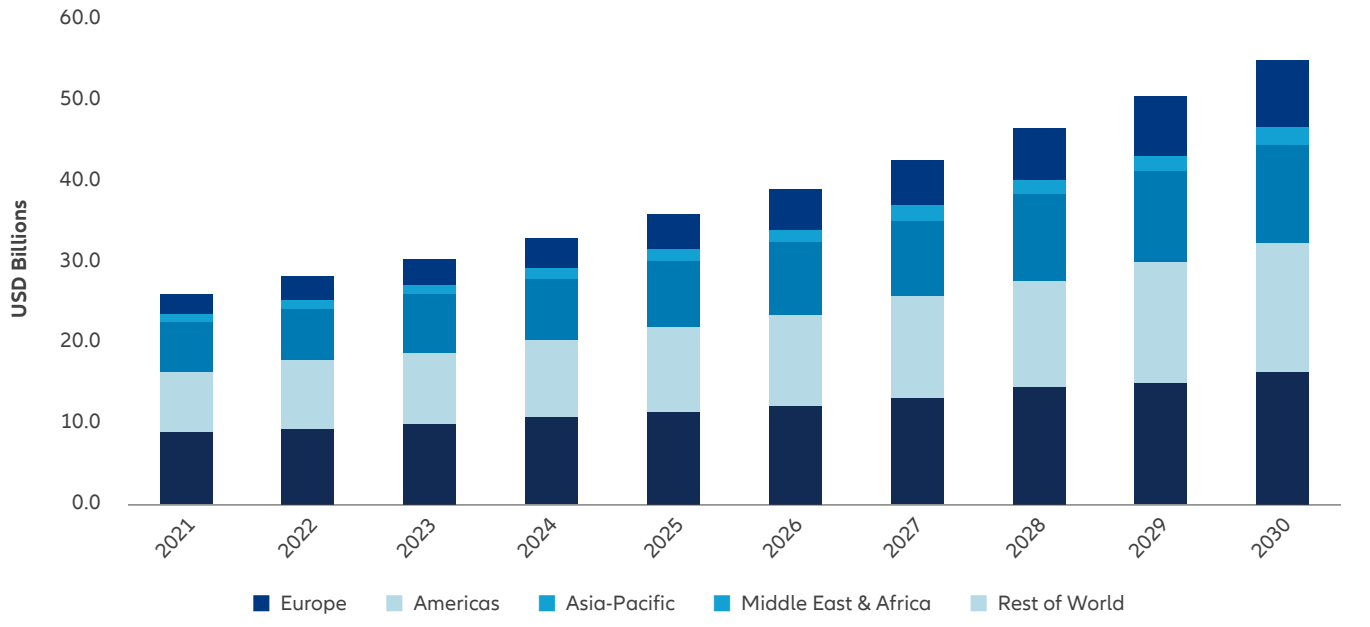
In addition, the anthropogenic pollution of groundwater – i.e., its contamination with vast quantities of waste, wastewater and residue from households, industry, mining, and agriculture – puts additional pressure on this indispensable resource.

42 % of US crops exports (mostly corn) are grown from depleted groundwater[7]. The more groundwater is depleted and, consequently, the fewer crops can be produced and exported, the more importing countries and their food supply are put at risk.

Improving the storage and access to freshwater resources with sustainable solutions

The sustainable and holistic preservation, management and restoration of natural freshwater storage capabilities represents a market that, in certain segments, is set to show a nearly double-digit growth over the coming years. This is being driven by, among other factors, rising expenditure on digital solutions that help to monitor and measure groundwater levels and water quality in a cost-efficient way.

Global water and wastewater utility sector expenditure on digital solutions is projected to show an annual growth rate of 8.8%, reaching a market value of USD 55.2 bn in 2030, more than doubling the USD 25.9 bn in investments made in 2021.[8]



Source: Cleantech Insights: The Future of Digital Water Technologies. As of March 2023.

This developing market also includes the identification of and investment in innovators, key enablers and beneficiaries along the water entire value chain.

For instance, a worldwide leading manufacturer of sophisticated water and wastewater treatment technologies, services and products has developed a hydroacoustic current meter (Acoustic Doppler Current Profilers, ADCP) to measure water velocity and complex water flow conditions for professional environmental water monitoring.

A Sweden-based leader in the field of heat exchangers offers groundwater-based self-produced heating and cooling systems that significantly reduce emissions, helping to optimise energy consumption and securing the groundwater temperature.

To enable those and other frontrunning companies to further develop quality and resiliency products that improve the sustainability of natural water resources it is crucial to redirect even more capital flows towards solutions that address current and future water-scarcity and water-quality challenges.

[1] UN World Water Day
[2] How Much Water Is on Earth? – Earth How. As of September 25, 2023.
[3] UN World Water Development Report 2022. As of March 2022.
[4] UN World Water Development Report 2022: Agriculture. As of April 2023.
[5] The Groundwater Project: Large Aquifer Systems Around the World. As of July 2022. Updated March 2023.
[6] Nature.com: Rapid groundwater decline and some cases of recovery in aquifers globally. As of January 2024.
[7] United Nations University; Institute for Environment and Human Security (UNU-EHS): Technical Report. Groundwater depletion. As of 2023. [8] Cleantech Insights: The Future of Digital Water Technologies. As of March 2023.

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