



LIQUIDITY PREMIUM: MANAGING ASIA'S INCREASINGLY SCARCE WATER RESOURCES

Written by



Foreword by Cargill

Allocation of water is one of the most pressing issues of our modern age. Agriculture today consumes 70% of the world's fresh water, while rapid urbanization coupled with increasing demand for water from growing populations in Asia have intensified stress on the region's water resources. We are already seeing water service interruptions in some countries in the region. The world's demand for water is only going to increase, while the supply will become more and more uncertain. In fact, some projections suggest developing Asia will face severe supply-demand gaps, which is sure to impact Asia's economic development and heighten political tensions in the region.

Water scarcity, over-exploitation and climate change will continue to negatively affect food systems if current water management practices continue. Water shortages are also likely to lead to political instability in the future with countries vying for access to cross-border freshwater sources. Most of the challenges relate the usage and governance of water resources, rather than sheer availability of freshwater. With that in mind, it's critical that all stakeholders come together to mitigate this challenge through better water management practices.

Implementing policies that maximize water supplies, encouraging crop diversification and investing in technologies to address water use inefficiencies are all important steps to help the world develop sustainably. They require full participation of all parties, from government and enterprises to the agricultural sector and the public, to overcome current challenges and prepare for the future. Read more about these issues and the plausible solutions in this report.

About the research

A thirsty region is part of *Fixing Asia's Food Systems*, a five-part research programme commissioned by Cargill. The research is based on two surveys conducted in November 2017 and March 2018 of a total of 820 industry leaders in the region, and expert interviews.

We would like to thank the following experts for contributing their time and insights:

- Yusuke Satoh, PhD, International Institute for Applied Systems Analysis
- Rajendra Singh, chairman, Tarun Bharat Sangh

This report was written by Adam Green and edited by Rashmi Dalai. HuiQi Yow also provided editorial support.

LIQUIDITY PREMIUM: MANAGING ASIA'S INCREASINGLY SCARCE WATER RESOURCES

In the 1980's Rajendra Singh decided to abandon his medical practice and become a water activist in India's northwest state of Rajasthan. The monsoon-dependent region faced a water crisis, a common occurrence today still. While treating patients for night blindness and other malnutrition symptoms, he saw his efforts were often too little, too late. "We need water, not medicine," people told him.

In the three decades since, Mr Singh has promoted community-led water management techniques and built over 11,000 water-harvesting structures known as *johads*, or traditional earthen dams across central Asia and Africa. These *johads* collect rain during the monsoon season and allow the captured water to slowly seep into the groundwater during the dry season. The result is a significant improvement in local water tables year round.

"Today our engineers and our technologies teach us to make maximum use of natural resources, but if people never think about the nutrition of nature, nature can't think about the nutrition of people," Mr Singh says.

While one might argue Rajasthan's climate is extreme, a confluence of factors—population growth, agricultural groundwater exploitation and a changing climate—threaten to pull Asia's entire water system into crisis. As of 2011 41 countries were experiencing water stress, with ten close to depleting their freshwater supplies, and the trend is worsening.¹ By 2050 Asia's groundwater usage is likely to increase 30% overall, with China, India and Pakistan accounting for 86% of those withdrawals².

Vienna-based International Institute for Applied Systems Analysis (IIASA) forecasts that by the 2050s up to two billion people in Asia could be affected by water shortages. "Our study projects an imminent increase in water scarcity, especially in regions that are home to a large population and/or those which produce food and industrial output, due to climate and socioeconomic change," says Yusuke Satoh, PhD at IIASA and an author on the study. Further, intensifying groundwater extraction creates more threats the deeper it goes, including higher risk of contamination with pollutants such as arsenic, as well as lowering the water table.

Addressing the water question is vital not just for social and humanitarian reasons, but for global progress. It is a need recognised within the UN's 17 Sustainable Development Goals (SDGs); SDG six calls for adequate clean water and sanitation in all nations.

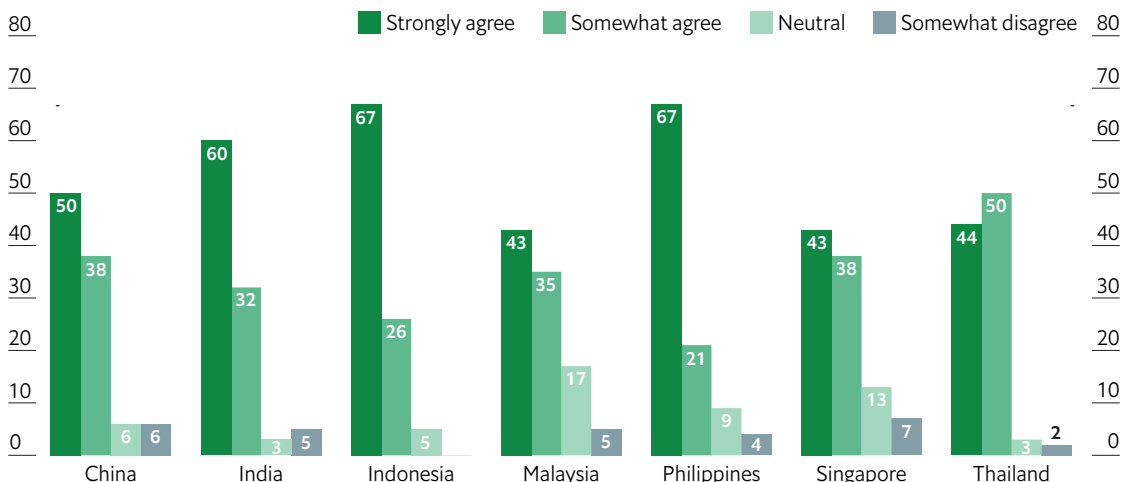
¹ Clean water and sanitation, <http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-6-clean-water-and-sanitation.html>

² Asian water development outlook 2016, <https://www.adb.org/sites/default/files/publication/189411/awdo-2016.pdf>

This water scarcity also heavily impacts Asia's food system. According to a recent study conducted by The Economist Intelligence Unit (EIU), which surveyed 420 executives of food producers and agricultural companies across China, India, Indonesia, Malaysia, the Philippines, Singapore and Thailand in March 2018, senior executives in the region are deeply concerned about the potential for water scarcity to impact their businesses and regional economies. Almost 90% of survey respondents agree that water scarcity could impact Asia's economic development. Worry is most acute in Indonesia and the Philippines, where 67% strongly agreed that water scarcity could affect economic development, compared to 43% in Singapore and 44% in Thailand.

Figure 1: Fear of water

Indicate your level of agreement with the following statement: Water scarcity could impact Asia's economic development. % respondents



Source: The Economist Intelligence Unit

Natural hardship, or bad choices?

Mr Singh argues that water does not have to be scarce though, even in areas cursed with little rainfall. His sentiments are shared by a long line of thinkers that most famously include the Indian economist Amartya Sen. He has argued that natural disasters like famines and droughts are often aggravated and sometimes caused by political conflict, poor governance, dysfunctional institutions and inadequate planning. This suggests that they can be deterred with human effort.

Singapore is a case in point. The city-state has scarce freshwater resources but, through technological innovations like desalination and filtration along with water agreements with other nations, it has become a regional hydro-hub³. In comparison, Bangladesh and Pakistan, endowed with a dense network of natural rivers and large glaciers respectively, both suffer water insecurity^{4,5}. While this situation reflects economic development levels in some ways—wealthier economies like Singapore can afford to adopt high-cost technologies and buy in water supplies from neighbouring countries while developing economies often don't have either option available—it also shows that viable water systems are not simply down to meteorological luck.

Instead, all countries can do much more to strengthen water-system resilience, starting with reducing waste. "Paddy and sugarcane are water-intensive crops," argues Mr Singh. "In my region, in contrast, we grow dry crops, which consume less water and give healthier food like pulses, oilseed and mustard. That is difficult if a farmer is greedy." Water subsidies can incentivise farmers to favour water-hungry but nutritionally barren cash crops. "But if people realise there is not enough water, they understand [the economic argument for] dry crops."

³ From open sewage to high-tech hydrohub, Singapore leads water revolution <https://www.reuters.com/article/us-singapore-water/from-open-sewage-to-high-tech-hydrohub-singapore-leads-water-revolution-idUSKCN0Q804T20150803>

LIQUIDITY PREMIUM: MANAGING ASIA'S INCREASINGLY SCARCE WATER RESOURCES

A majority of The EIU's survey respondents also see a lack of careful water stewardship as an issue in Asia, with 74% agreeing that much water is wasted. Indian companies raise the loudest alarm with 60% strongly agreeing to this point versus 38% in Indonesia and 44% in China.

To help deter waste, most respondents (86%) agree that water should have an economic cost for users; only 6% feel it should not. However, pricing in these costs is a policy challenge for governments that must balance economic costs with an ability to pay. Many poor communities around the world already face water shortages that would likely be exacerbated should the water made available become more expensive. Governments must invest in water infrastructure and sanitation for the poor while reducing distorting subsidies that encourage waste.

⁴ Land use policy <https://www.sciencedirect.com/science/article/pii/S0264837716302940>

⁵ Pakistan has more glaciers than almost anywhere on Earth but they are at risk https://www.washingtonpost.com/world/asia_pacific/pakistan-has-more-glaciers-than-almost-anywhere-on-earth-but-they-are-at-risk/2016/08/11/7a6b4cd4-4882-11e6-8dac-0c6e4acc5b1_story.html?utm_term=.39bcbb98f7fd

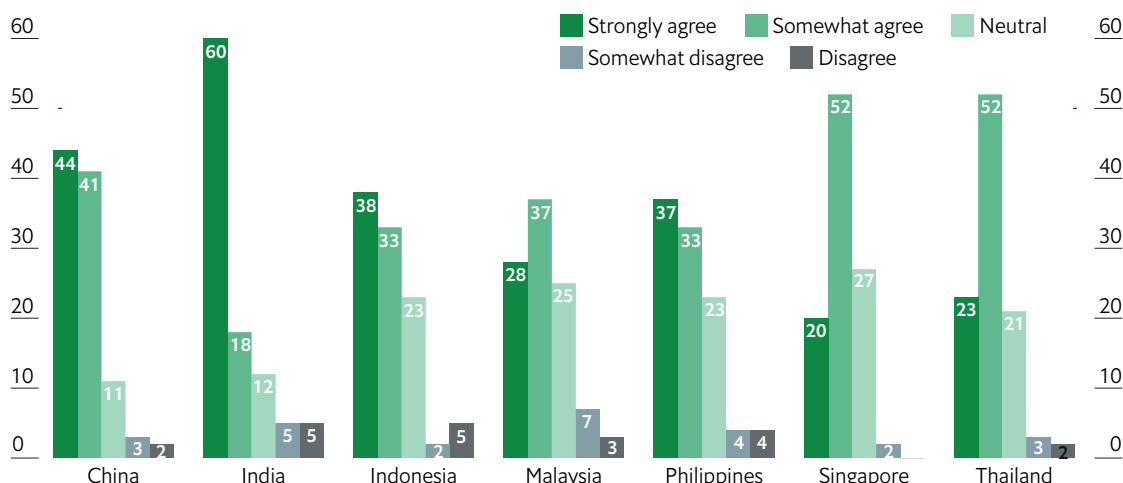
⁶ A bright future for solar-powered irrigation? <http://www.iwmi.cgiar.org/2017/11/a-bright-future-for-solar-powered-irrigation/>

⁷ Solar irrigation pumps: a new way of agriculture in Bangladesh <http://blogs.worldbank.org/endpovertyinsouthasia/solar-irrigation-pumps-new-way-agriculture-bangladesh>

⁸ 10 best bet innovations for adaptation in agriculture <https://cgspage.cgiar.org/rest/bitstreams/145982/retrieve>

Figure 2: Languishing liquidity

Indicate your level of agreement with the following statement: Much water is wasted
% respondents



Source: The Economist Intelligence Unit

Action from the agriculture sector is essential, argues Mr Satoh. "Because the majority of water demand stems from agriculture, improving its water management should be one of the most promising measures," he says.

He cites many best practices, including "greater irrigation efficiency [through] installing and maintaining efficient systems like sprinkler and drip irrigation, adopting new cultivars, optimising irrigation scheduling, and no-till farming and soil conservation practices". At the ground level, farmers could also deploy small-scale, decentralised renewable energy; solar-powered irrigation pumps already help farmers across Asia and offer new livelihoods for solar entrepreneurs who rent out pumps to farmers who may not be able to afford their own^{6,7,8}.

But change from agricultural players alone won't be enough. Mr Satoh argues industrial and municipal water conservation is also vital. "Installing water-saving equipment in industrial plants and households,

LIQUIDITY PREMIUM: MANAGING ASIA'S INCREASINGLY SCARCE WATER RESOURCES

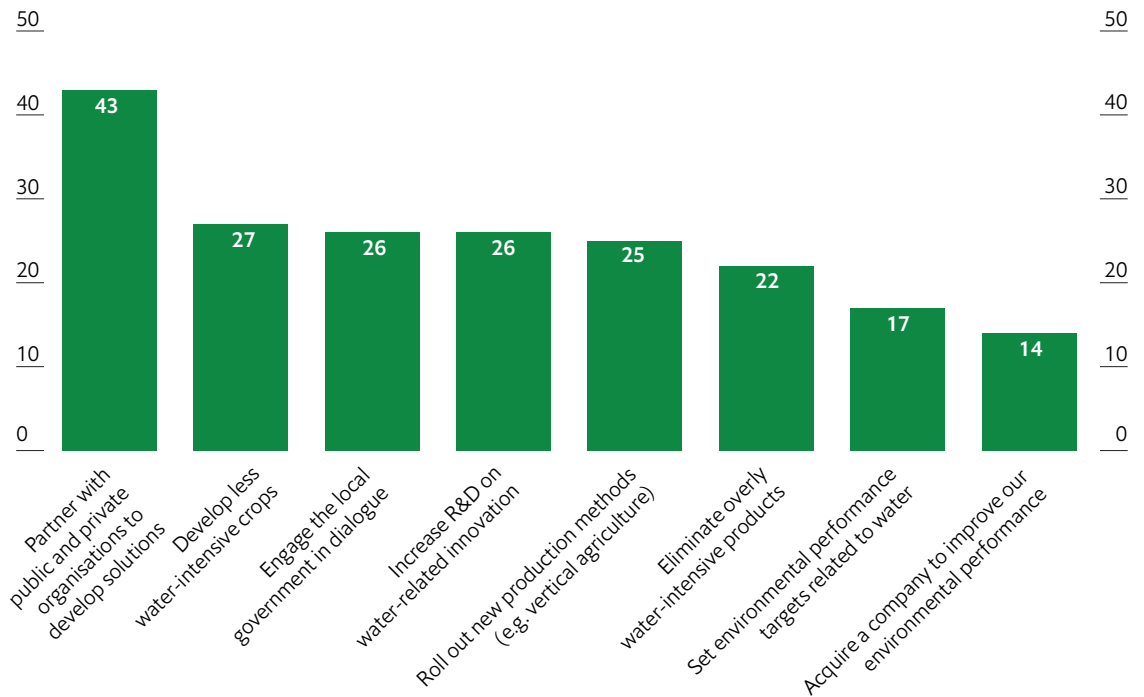
and an amelioration of leakage in water distribution” are significant opportunities to bolster conservation, he says.

To achieve these goals, partnerships between public and private partners (PPPs) stand out as the most popular approach to battling water scarcity among the survey respondents. Forty-three per cent state they are already part of one or more PPPs.

Setting smarter pricing, making investments in water infrastructure (particularly in poor areas), innovating, and encouraging behaviour change among heavy water users are also important steps countries can take to prevent water scarcity. With these efforts, Asia can continue to enjoy rising prosperity and economic growth. However, without action, decades of progress could dry up.

Figure 3: Filling the well

In what ways is your organisation trying to address water scarcity in your country? Select top two. % respondents



Source: The Economist Intelligence Unit

While every effort has been taken to verify the accuracy of this information, The Economist Intelligence Unit Ltd. cannot accept any responsibility or liability for reliance by any person on this report or any of the information, opinions or conclusions set out in this report. The findings and views expressed in the report do not necessarily reflect the views of the sponsor.

LONDON

20 Cabot Square
London
E14 4QW
United Kingdom
Tel: (44.20) 7576 8000
Fax: (44.20) 7576 8500
Email: london@eiu.com

NEW YORK

750 Third Avenue
5th Floor
New York, NY 10017
United States
Tel: (1.212) 554 0600
Fax: (1.212) 586 1181/2
Email: americas@eiu.com

HONG KONG

1301 Cityplaza Four
12 Taikoo Wan Road
Taikoo Shing
Hong Kong
Tel: (852) 2585 3888
Fax: (852) 2802 7638
Email: asia@eiu.com

GENEVA

Rue de l'Athénée 32
1206 Geneva
Switzerland
Tel: (41) 22 566 2470
Fax: (41) 22 346 93 47
Email: geneva@eiu.com

SINGAPORE

8 Cross Street,
#23-01 Manulife Tower
048424, Singapore
Tel: (65) 6534-5177
Fax: (65) 6428 2630
Email: singapore@eiu.com