GCSP
Geneva Centre for Security Policy
Where knowledge meets experience

Atlantic Council

NOVEMBER 2017 No. 6

STRATEGIC SECURITY ANALYSIS

Asian Water Security:

A Present and Future Test

by Dr Peter Engelke

1 Introduction

Few security risks are becoming as serious and far-reaching as those that fall under the heading of "ecological overshoot", i.e. the idea that humans are stretching the planet's resources to the breaking point and even beyond. The growing scarcity of fresh water on a rapidly changing planet is an important example of this phenomenon. Because water is central to every human need, an insecure supply of clean water raises the dangers of economic disruption, social tension, and even conflict over water resources at the domestic and international levels. These dangers are highest where water is scarce and governance (at the domestic or international levels) is poor.

This paper examines water security risk in Asia,[1], where water challenges affect several of the world's most populous and powerful states, and many smaller ones as well. The continent's enormous size, its multiple geopolitical tensions, the unprecedented and urban-centric speed of growth in the world's largest economies, and poor water governance at both the domestic and international levels mean that Asia is home to the world's greatest water security risks.

According to the United Nations, water security is defined as

the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.[2]

In a secure and sustainable world, societies would maintain the integrity of water resources and the ecosystems upon which those resources depend in order to provide clean water to all who need it.

However, it should surprise no one that we are a very long way from living in a world fitting this description. During the 20th century and into the 21st, countries around the world dammed, diverted, extracted, polluted, drilled, and tapped much of the planet's freshwater (groundwater and surface water – lakes, streams, rivers and glaciers). Population growth, rising wealth, and rapidly advancing technological capabilities together were the drivers behind a nearly eight-fold increase in global water withdrawals between 1900 and 2010[3]. In the years to come these same forces will ratchet up the pressure on the planet's freshwater sources. Simultaneously, climate change will increase the frequency and severity of drought, cause more evaporation from surface sources because of increased temperatures, and otherwise introduce greater fluctuations in supply due to altered precipitation patterns and variations in the timing of the spring snowmelt.[4]

KEY POINTS

- An insecure supply of clean water raises the dangers of economic disruption, social tension, and even conflict over water resources at both the domestic and international levels. These dangers are highest where water is scarce and governance (at the domestic or international levels) is poor.
- Asia provides the most powerful illustration of water security risks, with significant challenges that affect both the water supply and demand sides, as well as important governance shortcomings. While there are enormous disparities across Asia in terms of this issue, the continent's overall water outlook is discouraging.
- Much of Asia suffers from the consequences of investments in supply-side water infrastructure projects that have emphasised gigantic scale over the efficient use of water. These investments have often been made without adequate consideration of their economic, social, diplomatic and environmental costs, nor with much concern for long-term impact.
- The rapid pace and massive scale of Asian urbanisation are placing new stresses on water demand, because city dwellers consume more water than their rural counterparts.
- Water experts and practitioners across Asia are fully aware of the continent's many problems and are diligently working to overcome them. There will be no easy fix, however, because of Asia's massive scale plus significant financial, political and institutional obstacles. As in other domains, there is no substitute for good governance. Widespread progress on the continent will occur when local, regional, and national leaders use good data and information to make the right decisions to manage water resources smartly and cooperatively over the long run.

1 Asia consists of a number of different sub-regions (Central Asia, East Asia, South Asia, Southeast Asia, Western Asia), some of these are referred to in this paper.

2 UN Water, Water Security and the Global Water Agenda, Hamilton, UN University Institute for Water, Environment and Health, 2013, p.1, as quoted in D. Michel, Water Security, Conflict and Cooperation, Geneva, Geneva Centre for Security Policy, 2016, p.4.

3 Y. Wada et al., "Modeling Global Water Use for the 21st Century: The Water Futures and Solutions (WFaS) Initiative and Its Approaches", Geoscientific Model Development, Vol. 9, 2016, p.175.

4 A succinct summary of these trends is provided in Michel, 2016.

For these reasons, few serious observers of global water trends are optimistic about current conditions or prognoses for the future. For example, the authors of an often-cited 2016 study of global water conditions estimated that two-thirds of the world's population (four billion people) now live under "severe water scarcity" conditions for at least one month per year.[5]

In 2015 the United Nations Educational, Scientific, and Cultural Organisation published a major report forecasting that water demand would rise across every sector in the years ahead. "By 2030", its authors wrote in summarising the available evidence, "the world is projected to face a 40% global water deficit under [a] business-as-usual scenario".[6] Other similarly grim assessments abound.

The global security community recognises the linkages between water stress, risk and insecurity. In 2012 the US Office of the Director of National Intelligence issued a first-of-its-kind intelligence community assessment on global water insecurity and its implications for US foreign and security policy. It forecast that water stresses over the coming decade "will risk instability and state failure, increase regional tensions, and distract [other countries] from working with the United States on important US policy objectives".[7] In 2015 the World Economic Forum (WEF) made headlines when, in its celebrated Global Risks Report, it ranked water security as the greatest global risk measured in terms of impact. The 2017 edition ranked "water crises" third, marking the third consecutive year that WEF placed water insecurity in its top three global risks.[8]

2 Asian Water Security

Asia provides the most powerful and important illustration of these trends and their security risks. The world's largest and most populous (4.5 billion people in 2017) continent also has the greatest water security challenges.

While there are enormous disparities across the continent, Asia's overall water outlook is discouraging.

The facts are unpleasant. In 2016 the Asian Development Bank (ADB) estimated that 29 of 48 Asian countries were "water insecure" (according to a composite index measuring access to water for sanitation and core economic uses, the maintenance of aquatic ecosystems, and resilience to water-related disasters). After decades of investment in water infrastructure, Asia's per capita freshwater capacity is less than half the global average. Looking ahead, this picture becomes even grimmer. On the demand side, water use in Asia could increase by 55 per cent by 2050, the result of ongoing economic and population growth. On the supply side, Asian freshwater sources already suffer from over-extraction, a situation that will worsen as the climate changes. Altogether, the ADB suggested that by 2050, 3.4 billion Asians could be living in water-stressed regions. Yet water availability is only part of the problem, for Asian waterways are notoriously polluted. Despite some improvement, the ADB estimates that around 1.7 billion Asians still do not enjoy basic sanitation services; in many countries, only a small percentage of wastewater is treated before it is released into waterways.[9]

The natural distribution of the continent's freshwater is a large part of Asia's water problem. Much of Asia is arid or semi-arid, as is also true of Western Asia. Much of South and Central Asia and northern China suffer from seasonal variability in water supply, with dry conditions prevailing during the spring and summer months. Of the world's four billion people who live under seasonal water scarcity conditions (according to the 2016 ADB study referenced above), fully half – two billion people – live in China and India.[10] These densely populated Asian regions are fed by a few critically important rivers, the ten most important of which flow out of the so-called "water tower", the Hindu Kush-Himalayan region and its enormous mountain ranges.[11]

But nature explains only a part of Asia's water challenge: human activities explain the rest of it. Put in the simplest terms, the breakneck pace of Asian economic growth, combined with its enormous population, have been the drivers behind the systematic outstripping of the continent's water resources.

5 M.M. Mekonnen and A.Y. Hoekstra, "Four Billion People Facing Severe Water Scarcity", Science Advances, Vol. 2, 2 February 2016, pp.1-6.

6 UNWWAP (United Nations World Water Assessment Programme), The United Nations World Water Development Report 2015: Water for a Sustainable World, Paris, UNESCO, 2015, p.11.

7 ODNI (Office of the Director of National Intelligence), Intelligence Community Assessment: Global Water Security, 2 February 2012, p.iii.

8 WEF (World Economic Forum), The Global Risks Report 2017, Geneva, WEF, 2017, Figure 2.

9 ADB (Asian Development Bank), Asian Water Development Outlook 2016: Strengthening Water Security in Asia and the Pacific, Mandaluyong City, ADB, 2016, pp.xiii-xv, 14-16.

10 Mekonnen and Hoekstra, 2016, pp.1-2 and Figure 1. The authors estimated that one billion live in India, 0.9 billion in China, 120 million in Pakistan and 130 million in Bangladesh.

11 These rivers are the Amu Darya, Brahmaputra, Ganges, Indus, Irrawaddy, Mekong, Salween, Tarim, Yangtze and Yellow. For background information, see ICIMOD (International Centre for Integrated Mountain Development), "Hindu Kush Himalayan Region", 2017, <http://www.icimod.org/?q=1137>.

To fulfil rapidly increasing demand for water nearly everywhere in Asia, over the past several decades many countries have dammed and diverted water from the continent's major rivers and lakes while vacuuming much of its groundwater to boot.

Several major Asian states suffer from the consequences of long-standing, often-massive, supply-side investments in water infrastructure. A combination of technocratic faith in engineering, an often-unshakeable belief in the merits of bigger-is-better gigantism, too-frequent contempt for ecological constraints, too-infrequent attention to water "efficiency" (referring to the productivity of water inputs, e.g. water wasted during irrigation), and a political preference for immediate and tangible results all created this infrastructural outcome.

Frequently, investments have been made without full consideration of the economic, social, diplomatic and environmental costs, and without much concern for long-term impact.

Large parts of Asia suffer from legacy water infrastructure built during periods dominated by this socio-technical paradigm. For example, starting in the late 1950s, the former Soviet Union began diverting water from two great Central Asian rivers, the Amu Syr and Amu Darya, in order to increase cotton production.

Although aware that the diversion would harm the Aral Sea and the regional economy based around it (e.g. its rich fisheries), Soviet planners went ahead anyway, having convinced themselves that cotton production mattered more than everything else. Robbed of water from these rivers, the Aral Sea has since shrunk to a tiny fraction of its original size, with predictable and catastrophic social, economic and environmental consequences.

One observer has called the destruction of the Aral Sea "a monumental disaster, the scope and scale of which have few parallels in human history".[12]

Decades-old Soviet decisions live on in today's central Asia. Now economically dependent on the Soviet-built system for cotton production and hydropower, the Central Asian and former Soviet republics of Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan are locked into ongoing struggles over how to share water that would otherwise empty into the Aral Sea. What is not seriously discussed – and likely never would happen in any event – is the restoration of the sea to its former healthy glory.[13]

Nor is this unfortunate story just a historical one. Although the intellectual climate in Asia and in other world regions has long since brought the bigger-is-better technocratic model into question, the forces that animated it still retain their influence in Asia. China is the largest and weightiest example. Taking his cues from both the Soviet Union and the United States, Mao Zedong became captivated by gigantic water infrastructure projects, seeing in them both the promise of economic development and showpieces of communist China's technocratic might.[14] Even after Mao's death the country's most significant water projects followed this model. The massive Three Gorges Dam, originally conceived by Mao, is the most famous illustration. After decades of planning the Chinese government finally pressed ahead with construction in the 1990s, despite widespread dissent regarding the dam's environmental and social costs. Finished in 2012, Three Gorges is the world's largest dam in terms of hydropower generation (22,500 megawatts). The dam's prodigious hydroelectric power, combined with its show-the-world demonstration of Chinese engineering prowess, appear to be the sole justifications for Three Gorges' enormous environmental and social costs. With a reservoir extending 600 kilometers upstream, the dam has displaced some 1.3 million people and flooded 1,350 villages.[15]

The Three Gorges Dam is just one example of China's water infrastructure planning. The country is in the process of altering its entire freshwater plumbing through the South-North Water Transfer Project (SNWTP). This project aims to solve one of China's oldest problems, which is the imbalance between a water-rich south and a water-scarce (but cities and farmland rich) north. Called "the most ambitious inter-basin water transfer scheme in the world", the SNWTP will ship billions of cubic metres of river water annually to northern China along three routes (one eastern, one central and one western) if the project is finished in its entirety.[16]

12 K.D. White, "Nature-society Linkages in the Aral Sea Region", Journal of Eurasian Studies, Vol.4(1), January 2013, p.18.

13 Ibid., pp.18-33.

14 The best-known environmental history of Mao's China is J. Shapiro, Mao's War against Nature: Politics and the Environment in Revolutionary China, New York, Cambridge University Press, 2001; see especially chap. 1.

15 USGS (US Geological Survey), "Three Gorges Dam: The World's Largest Hydroelectric Plant", n.d., <https://water.usgs.gov/edu/hybiggest.html>; S.-L. Wee, "Thousands Being Moved from China's Three Gorges – Again", Reuters, 22 August 2012, <http://uk.reuters.com/article/us-china-threegorges-idUSBRE87L0ZW20120822>; International Rivers, "Three Gorges Dam", n.d., <https://www.internationalrivers.org/campaigns/three-gorges-dam>.

16 M. Webber, B. Crow-Miller and S. Rogers, "The South-North Water Transfer Project: Remaking the Geography of China", Regional Studies, Vol.51(3), 2017, p.371.

As with Three Gorges, the SNWTP assumes that massive engineering projects are the solution to China's water challenges, regardless of competing claims to the water, environmental impacts, high construction costs or significant diplomatic consequences. The decision to build the SNWTP, as was also true of the Three Gorges Dam, reflects the makeup of China's political leadership, which is disproportionately trained in engineering.[17]

Yet despite the frenetic pace of dam building and surface water diversion, Asian societies have had a difficult time finding enough surface water to quench their thirst.

They therefore have turned to groundwater reserves. Not surprisingly, the largest groundwater users are both the most heavily populated states and those that have large arid or semi-arid regions. Of the world's four largest groundwater users, three are Asian states fitting this profile (China, India and Pakistan). Tapping aquifers is a strategy that works well as long as they last. The problem is that while some of the continent's aquifers are enormous, they are not boundless. Several Asian states have become overly dependent on this largely finite source: Asia has 70 per cent of the world's land that is irrigated by groundwater. Moreover, states spend huge sums of money on the pumps and energy needed to draw water from aquifers.[18]

Many Asian countries remain handicapped by the poor management of water resources, although there are exceptions (several East Asian countries and Singapore generally receive high marks for water governance). Problems include high rates of water loss through leakage and evaporation (often the result of poor system design and chronic underinvestment in system maintenance); low water efficiency; the inequitable distribution of water, with poor citizens very often having inadequate access to potable water and sanitation services; chronic water pollution; and the widespread degradation of ecosystems.[19]

Much of Asia therefore faces significant water security risks in the years and decades to come. In a 2015 review of global water risks, the Organisation for Economic Cooperation and Development and Global Water Partnership placed eight Asian countries in the top ten most at-risk countries for water shortages, eight of ten for flooding risk, and five of ten for inadequate sanitation. Across these three categories of risk, Asian countries were ranked both first and second (China, India and Pakistan occupied the first or second ranking across every category). [20]South Asia, the authors argue, "has the largest global concentration of water-related risks, including severe impacts across the full range of hydrological variability (droughts to floods), the largest global concentration of people without adequate sanitation, and growing environmental threats".[21]

Asia's water security risk is made worse by a general lack of cooperation over transboundary water resources. Although some progress has been made in recent decades, for example through the Mekong River Commission, Asian states have a poor track record of building the kinds of robust multilateral institutions that can help smooth over water disputes. Rather, "hydro diplomacy" often falls victim to disputes over other issues, such as contested borders, or is itself a factor in the distrust between neighbouring states. South, Central and Southeast Asia all have these elements.[22] The 2012 US intelligence community's assessment of global water risk placed two Asian river basins, the Amu Darya and Brahmaputra, in its highest risk category, citing increased regional tensions over water in the decades to come.[23]

3 Future Shock: Water and Urbanisation in Asia

During the launch of the 2016 ADB report on Asian water security referenced above, ADB president Takehiko Nakao said he believed that "the most daunting challenge is to double food production by 2050 for an increasingly prosperous and growing population, while also providing water for more domestic users and meeting industrial and energy demands".[24]

17 Ibid., 372-375. On Mao and his legacy, see B. Chellaney, Water: Asia's New Battleground, Washington, DC, Georgetown University Press, 2011, pp.59-75.

18 ADB, 2016, pp.7-8 and Table 1. Asian countries often fund groundwater extraction through energy subsidies and direct payments.

19 Chellaney, 2011, pp.1-11.

20 C.W. Sadoff et al., Securing Water, Sustaining Growth: Report of the GWP/OECD Task Force on Water Security and Sustainable Growth, Oxford, University of Oxford, 2015, graphic "Top ten countries for people at risk of water security", p.25.

21 Ibid., pp.22-23.

22 For a review of transboundary river governance at global scale, see UNEP (United Nations Environment Programme), Transboundary River Basins: Status and Trends. Volume 3: River Basins, January 2016, pp.110-137.

23 ODNI, 2012, p.v. Its highest risk category was defined as "inadequate" river basin management capacity. Although the ODNI report placed the Mekong basin in a lower risk category ("limited"), it also cited the likelihood of increased regional tension over Mekong water development. The report considered the Indus basin to have "moderate" management capacity.

24 SciDev.net, "Asia-Pacific 'Hot Spot for Water Insecurity'", 6

Nakao neatly summarised a key part of Asia's water security challenge, which is to provide enough clean water to an ever larger and more prosperous population. That larger and richer population increasingly lives in cities. Asia and Africa are the world's two fastest-urbanising continents, and together are forecast to account for nearly 90 per cent of the world's urban growth between now and 2050. But while African urbanisation is massive, Asia's is far bigger. In 2050 Asia will have 3.3 billion people living in cities, an increase of roughly 1.3 billion from 2014, and a scarcely believable three-billion-person increase in the hundred years between 1950 and 2050.

By way of comparison, in 2050 Europe is forecast to have 581 million people living in cities, while North America will have 390 million.[25]

Although agriculture consumes the most water by far across Asia, and therefore must be addressed if societies are to become water secure, the scale and pace of Asian urbanisation has become a powerful new force in this equation.[26] Urbanisation forces the water security issue onto local and national agendas in ways that it had no been in decades past.[27]

Asia's mass urbanisation is placing new stresses on water demand because city dwellers consume more water than their rural counterparts. The increased wealth that follows in the wake of urbanisation translates into more water use. Household amenities such as showers and flush toilets give urbanites the means to consume more water directly (at least, those who can afford such comforts). Rising urban wealth also means that more water is consumed indirectly, through changing diets plus greater consumption of energy and manufactured goods.

This combination of rapid urban population growth and increased per capita consumption can and has led to local water source exhaustion. Large cities around the world often draw on distant water supplies because local supplies are insufficient (Los Angeles is a well-known example). This problem is especially acute in Asia, given its large number of rapidly growing cities. Predictably, local source exhaustion is worst in regions such as northern China and the Indian subcontinent that face both rapid urban growth and arid or semi-arid conditions. Both Karachi and Beijing, to name just two megacity examples, draw water from distant river sources to make up for local deficits. The stress that Beijing has placed on its surface and groundwater sources is a major reason why the SNWTP exists.[28]

Beijing's rapid extraction of groundwater has also caused severe land subsidence: the city is sinking by 11 centimetres per year according to one recent study.[29] Beijing is hardly alone in this regard. Subsidence brought about by groundwater extraction and other factors such as heavy building weights is a serious problem elsewhere, especially in low-lying coastal cities such as Guangzhou and Shenzhen that are at significant risk of flooding.[30]

At the same time, rapid urbanisation also creates inequalities – and therefore tensions – caused by differing levels of access to water. This is caused by rapid urbanisation that creates an urban underclass in addition to a newly wealthy one. The urban underclass is disproportionately exposed to poor sanitation and hygiene and the public health problems that come from these factors. Roughly half of the world's one billion slum dwellers live in Asia. These are the people who are most likely to have inadequate access to clean drinking water and modern sewerage systems that treat sewage and wastewater to make them reusable (in India as of 2011, only 9 per cent of wastewater was treated, 10 per cent in the Philippines, 14 per cent in Indonesia and 4 per cent in Vietnam).[31]

Inadequate municipal service provision means that poor residents often have little choice but to buy drinking water at exorbitant prices from private vendors, often criminal gangs.

September 2016, <http://www.scidev.net/global/water/feature/asia-pacific-hot-spot-for-water-insecurity.html>.

25 UNDESA (United Nations Department of Economic and Social Affairs), Population Division, World Urbanization Prospects: The 2014 Revision, 2015, Table II, pp.8, 38.

26 SciDev.net, "80% of Water Consumed in the Asia-Pacific Region Is for Agriculture", 2016.

27 Unless otherwise noted, the remainder of this section is drawn from P. Engelke, The Security of Cities: Ecology and Conflict on an Urbanizing Planet, Washington, DC, Atlantic Council and Stimson Center, November 2013.

28 R. Schmitz, "A Warning for Parched China: A City Runs out of Water", Marketplace, 25 April 2016, <https://www.marketplace.org/2016/04/21/world/warning-parched-china-city-runs-out-water>; S. Toppa, "Dry Dams, Leaky Pipes and Tanker Mafias – Karachi's Water Crisis", The Guardian, 28 June 2016, <https://www.theguardian.com/global-development-professionals-network/2016/jun/28/karachi-pakistan-water-crisis>.

29 F. Hao, "'Irreversible' Subsidence Is Causing Beijing to Sink", China Dialogue, 30 August 2016, <https://www.chinadialogue.net/article/show/single/en/9219--Irreversible-subsidence-is-causing-Beijing-to-sink->.

30 M. Kimmelman, "Rising Waters Threaten China's Rising Cities", New York Times, 7 April 2017, <https://www.nytimes.com/interactive/2017/04/07/world/asia/climate-change-china.html>..

31 ADB (Asian Development Bank), Department of External Relations, Fast Facts: Urbanization in Asia, 15 November 2011.

In Karachi, home to 20 million people, a combination of outdated water infrastructure, increasingly distant water sources, poor monitoring technology and explosive urban growth have meant the proliferation of a "water tanker mafia" that "illegally punctures pipelines and siphons off water to sell at inflated rates on the black market".[32] As in other rapidly growing megacities around the world, gangs have proliferated in Karachi, taking advantage of rampant slum growth. In the past, employees of Karachi's municipal water department have refused to venture into entire sections of the city, fearing for their personal safety.[33]

4 Conclusion

Asia's water challenges are both emblematic of the world's water challenges and singularly important among them. One can easily envision a worst-case scenario for water insecurity, when climate change and other forms of environmental degradation severely impact Asia's surface water sources. Under such a scenario, multiple Asian countries (most critically, China, India and Pakistan) would fail to rein in their rapidly rising water demand, in turn exhausting their own surface and groundwater sources. Water scarcity would therefore become the rule across large swaths of Asia, leading countries to look elsewhere to satisfy their needs. It is this outcome that most worries security analysts: Asia's major powers come to view hydro diplomacy in zero-sum rather than positive-sum terms. Here, China would play an even more outsized role than it already plays. In possession of the headwaters of East, Southeast, and South Asia's major rivers, China would ignore its downstream neighbours' pleas and divert increasing amounts of river water for its own use. In such a scenario, water would become a source of Asian insecurity and a flashpoint for conflict, for example between India and China. Instead of helping to build trust in troubled regions, water would become a primary source of mistrust and even overt conflict.

Yet this worst-case scenario does not have to occur, and there is reason to hope that a rosier picture will emerge in the years ahead. A major reason for optimism is that water experts and practitioners across Asia are fully aware of all the problems elucidated in this paper and are diligently working to overcome them. In Asia and elsewhere around the world, water experts have gravitated toward models that smartly manage water resources rather than those that just maximise water source extraction. One long-standing example, called "integrated water resources management", places water management on a holistic footing. In this model, policy, institutions, investments in infrastructure, and management tools are all aligned toward smart and sustainable ends.[34] Asian scholars and practitioners also point to the need to reconfigure water relations, arguing that transboundary cooperation on water use has enormous potential for building trust among and between countries. What is needed are new avenues of transnational dialogue, with new actors and forums, all designed to treat water as a common resource to be managed in concert. Instead of the securitisation of water, these experts argue, Asian countries need to view this resource through a more cooperative and inclusive prism.[35]

In Asia's cities, too, there is widespread acknowledgement that alternative solutions to urban water problems need to be found.

Recognising that traditional approaches to water management are unlikely to resolve the challenges presented by Asia's spectacular urban growth, water managers are looking at decentralised wastewater management processes, water-efficient technologies, investments in "green" infrastructure, and a whole range of other approaches that can overcome the expensive and water-intensive management approaches that have long been used in cities. China, for example, is piloting a programme called "sponge cities", an urban infrastructure programme that mimics natural systems to filter rainwater for both flood and pollution control.[36]

Yet despite these promising developments, Asia's water security problem has no easy fix. Intellectually, alternative water management models might exist, but older models still retain their hold on policymakers and institutions long after their utility has been exhausted.

32 Toppa, 2016.

33 M. Maher, "Can Text Messaging Solve Karachi's Incredible Unpaid Water Bill Problem?", Citiscope, 25 March 2014, <http://citiscope.org/story/2014/can-text-messaging-solve-karachis-incredible-unpaid-water-bill-problem>.

34 ADB, 2016, p.67; T.A. Larsen et al., "Review: Emerging Solutions to the Water Challenges of an Urbanizing World", Science, Vol. 352(6288), 20 May 2016, p.930.

35 Based on author's interviews in Asia, August 2017.

36 Larsen et al., 2016; T. Wong, "How Developing Cities Can Meet the Challenges of the 21st Century", 19 October 2016, <https://blogs.adb.org/blog/how-developing-cities-can-meet-challenges-21st-century>; Y. Xu, "Sponge Cities: An Answer to Floods", China Water Risk, 16 May2016, <http://chinawaterrisk.org/resources/analysis-reviews/sponge-cities-an-answer-to-floods/>.

Economically, there might be widespread recognition that water is priced too low to encourage conservation and efficiency, but, as elsewhere in the world, it remains politically unpalatable across much of Asia to increase water prices.

Financially, there might be a desire to build cutting-edge water management systems, yet the cost of building new infrastructure and rebuilding legacy infrastructure remains enormous and, for poorer countries, out of reach. Diplomatically, there might be an awareness that Asia generally lacks the robust multilateral institutions that can manage and contain inter-state conflict over shared water resources, yet there are far too few institution-building initiatives that are showing demonstrable progress toward such an end.

It is important to recall that Asia is a massive continent with dozens of countries and billions of people. Some Asian countries do not fit the profile sketched in this paper; for example, Japan, South Korea and Singapore generally receive high marks for their water management. Singapore, indeed, has managed to overcome its own severe water scarcity problem through sound management, creativity and foresight. In Singapore's case, good governance has included a healthy dosage of policy innovation, which has helped to make the country water secure while giving it a deserved global reputation for leadership in this space. However, Singapore's small size, unique geography and unusually future-oriented leadership limit its applicability as a case study. Yet it shows that in the case of water challenges, as in other policy domains, there is no substitute for good governance. Progress on the wider Asian continent will occur when local, regional, and national leaders use good data and information to make the right decisions to manage water resources smartly and cooperatively over the long run.

About the author

Peter Engelke is a Senior Fellow within the Atlantic Council's Brent Scowcroft Center on International Security and an Executive-in-Residence at the Geneva Centre for Security Policy. His diverse work portfolio involves assessing global trends, connecting them to current challenges, and designing strategic responses for policymakers and thought leaders around the world. His most recent Atlantic Council reports include Keeping America's Innovative Edge; Crafting a Resilient World: A Strategy for Navigating Turbulence; and Mediterranean Futures 2030. Previously, Dr Engelke was a visiting fellow at the Stimson Center and was on the research faculty at the Georgia Tech Research Institute, where he co-authored his first book, Health and Community Design. His second co-authored book The Great Acceleration, 2016, is a global environmental history since 1945. Dr Engelke is a former Bosch Fellow with the Robert Bosch Foundation in Stuttgart, Germany. He holds a Ph.D. in history from Georgetown University and is on the adjunct faculty at Georgetown's School of Continuing Studies. Dr Engelke currently resides in Geneva, Switzerland.

Where knowledge meets experience

The GCSP Strategic Security Analysis series are short papers that address a current security issue. They provide background information about the theme, identify the main issues and challenges, and propose policy recommendations.

Geneva Centre for Security Policy - GCSP
Maison de la paix
Chemin Eugène-Rigot 2D
P.O. Box 1295
CH-1211 Geneva 1
Tel: + 41 22 730 96 00
Fax: + 41 22 730 96 49
e-mail: info@gcsp.ch
www.gcsp.ch