



Running Low: The Politics of China's Water Insecurity

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Water insecurity due to increased demand and pollution is becoming a major issue for China as it continues to develop. In this issue of Canada-Asia Agenda, Yunnan Chen assesses the factors behind China's water insecurity, the domestic politics that complicate the issue, and some possible implications for Canada.

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Introduction: China's Widening Water Deficit

Water insecurity may be the biggest roadblock to China's economic and social development in the coming decades. The country's per-capita water supply is only about 25% of the world average, and it faces a water shortfall of around 40 billion cubic metres per year. Furthermore, growing demand from China's economic boom and population growth, along with pollution of its water sources, have raised the pressure on already dwindling surface and groundwater supplies. Shifting climate patterns and retreating glaciers are likely to exacerbate this trend.

On the one hand, China has made notable progress in the last decade in facing up to its many environmental challenges, including clear commitments by the central government to address the country's water shortfalls. On the other hand, the country's response to water management, particularly in the area of pollution control, has been criticized for being sluggish and ineffective, and there are significant impediments to implementing new policies and reaching planned targets.

China's water security strategy can be characterized as a case of policy incoherence, driven by a technocratic bias that favours supply-oriented strategies, such as the notorious South-North Water Transfer, that are executed to the detriment of ecological goals and sound management. The result is a strategy that addresses the symptoms, rather than the source, of China's water crisis.

The strategy also reflects the fragmented nature of political authority in China, as well as the strength of economic and energy interests in influencing policy. The implications are both domestic – water shortage and worsening water quality at the local level – and international – heightened tensions with

South and Southeast Asian neighbours over the control and management of shared and increasingly scarce water supplies.

The Parched North and the South-North Water Transfer Project

China's natural water scarcity is exacerbated by uneven distribution: the Northern river basins have only 20% of the country's total water, yet this is the region where the majority of China's agriculture and coal processing are concentrated. It is also the location of Beijing, its thirsty capital. The result is a systematic and widening water deficit in the North China Plain at a rate of 40 billion cm³ a year, with both surface and groundwater sources being consumed at unsustainable rates.

In an attempt to lessen this deficit, China has begun construction on the **South-North Water Transfer (SNWT) project**, which will divert the waters of the Yangtze River in the South to the Yellow River in the north. This behemoth of hydro-engineering, with its three vast man-made waterways and estimated cost of around US\$60 billion – three times as much as the Three Gorges Dam – is the most prominent example of China's ecologically unsound water security strategy.¹ And like the Three Gorges Dam, the SNWT's ecological and social impacts have provoked controversy. For example, its construction displaced hundreds of thousands of people at Danjiangkou dam. Some observers have raised concerns about the project's economic scale, especially since water security gains could be made more cheaply (and with lower risk) through efficiency upgrades to China's aging water infrastructure. Efficiency gains could also be made by reforming water pricing for irrigation and consumers so that prices accurately reflect its scarcity value and incentivize conservation.

A more fundamental issue is whether the SNWT project is even a viable solution to China's water scarcity. Droughts in 2011 left Danjiangkou and several supply reservoirs in central China running at minimum levels. Moreover, climate change is affecting the stability of glacier and rainfall water sources upon which the SNWT depends. The Himalayan glaciers that supply the rivers in the south, including the Yangtze and Mekong, are melting rapidly. This glacial melt will likely create a short-term abundance, which must be logistically managed by reservoir infrastructure, followed by a long-term water shortfall. In other words, the SNWT may lose its usefulness by the time the project is completed.

This strategy of increasing and redirecting water supply is reflected in [similar, smaller-scale water transfer projects](#) that are planned at the provincial level in Yunnan, Guangdong and Zhejiang provinces. In addition, the state has made huge investments in desalination technology, another expensive supply-side measure. The National Development and Reform Commission (NDRC) has targeted a tripling of production of water through desalination by 2015 to fuel demands of coastal industry.

The Many Costs of China's Water Policy

In terms of costs to China's economy, in 2007 the World Bank calculated the **economic costs** of poor water quality to be 1.13% of China's GDP. Even more insidious is the human cost: contaminated drinking water and contaminated food have been blamed for elevated rates of disease, including cancer, in parts of the country. 40% of China's total surface water is estimated to be unsafe for human use. Over the longer-term, water pollution and water scarcity will also raise questions about the viability of China's

¹ Currently two of three routes are expected to be operational as of 2013, however the Western route remains in planning stages, and estimated completion date for the entire project is 2050.

economic growth miracle, as declining water supplies threaten to undermine energy security, industrial output and food security.

China's central and local governments have good reason to be concerned. The effects of water shortage and pollution are not merely ecological, but also have implications for **social stability**. In 2005, there were around 50,000 environment-related protests.² Though official statistics are difficult to find, the number of such protests has reportedly been [growing at an average rate of 29% per year from 1996 to 2011](#).

In terms of **environmental costs**, the acceleration in hydropower and dam development is a particularly worrying trend given the poor environmental record of many dam companies. Though classified as a 'Clean Development Mechanism' and part of China's carbon reduction strategy, hydropower dams are often ecologically damaging to the remote, fragile valleys where they are often located. They [attract polluting industry to the area and still depend on back-up coal plants during periods of shortage](#). Experts have expressed concerns over their [possible negative impact on seismic activities](#) in geographically sensitive areas.³

There are also **regional political costs**. Large-scale dams have spillover effects on river ecosystems and soil fertility downstream. Chinese dams along the Mekong River impact livelihoods for downstream farmers and fisheries in Cambodia, Laos, and Vietnam. Hydropower development on the Brahmaputra River will also affect the water security of neighbouring India, Pakistan and Bangladesh. China's domestic water diversion plans have already sparked geopolitical tensions, primarily with India, which fears that the Western route of the SNWT will eventually expand to Tibet's transboundary rivers.

China's plans for hydropower dam development on the Yarlung Tsampo bend, which flows into the Brahmaputra, could easily extend into a diversion of the river, giving China control over the water security for Indian and Bangladeshi populations downstream. China has refused to enter into a water-sharing treaty with India over the river, and its verbal promises that it will not divert provide little assurance to its neighbours.

As climate change makes river flows and monsoons more temperamental, reliance on such water constructions may be detrimental to water security. Dams have an amplifying impact on both flooding and droughts downstream. Tensions between the Mekong riparian states over water – particularly tensions with China – result partly from the murky effects of upstream dams on water supply and droughts further south.

The Incoherent Politics of China's Water Security

Such heavy investments in "hard" technocratic solutions are logically opposed to and inherently disruptive to the "soft" conservationist policies that the state is simultaneously pursuing. The central government has prioritized water scarcity in the [Number 1 document](#) (2011), and the issue has been a

² See Katherine Morton, "China and Environmental Security in the Age of Consequences," *Asia-Pacific Review* 15 (2), November 2008, p.53; and Peter Gleick, *The World's Water 2011-12: The Biennial Report on Freshwater Resources*, Island Press, 2011, p.96.

³ Scientists have suggested that the Zipingpu dam of the Three Gorges Dam played a role in producing greater seismic stress and activity in the region, leading to the Sichuan earthquake of 2008. See <https://www.chinadialogue.net/article/show/single/en/4105-Hydropower-s-green-excuse>.

major feature of China's last three Five-Year Plans (FYP). These policies call for massive investment in addressing water scarcity, including mandating a 30% reduction in per capita water use in industrial and agricultural sectors, as well as targets to improve water efficiency, specifically in coal production.

A 'green streak' is also evident in policies dealing with pollution, including campaign-style clean-ups and the legal and financial sanctioning of polluting companies. New and amended water laws, such as the [2002 Water Law](#), also aim to help combat the problem of over-extraction in provincial rivers through allocating provincial water rights. The [Water Pollution Prevention and Control Law](#) (1984, 2008) raised polluter fees and established a permit system for water pollution.

China has also become a **world leader in government sponsored eco-compensation schemes**, including Investments in Watershed Services (IWS), a market-based strategy that uses payment transfers from the state to households and communities, and between downstream and upstream provinces, to incentivize and compensate for the watershed protection. More recently, the [Strictest Water Resources Planning System](#) (2012) outlined "Three Red Lines" – related to water efficiency, water pollution, and water demand – putting greater pressure on local governments to control water fees and pricing. The Ministry of Finance pledged US\$772 million to deal with the country's three major polluted rivers and its three most polluted lakes, and overall, China has pledged around US\$600 billion over the next decade to combat water shortages through infrastructure.

The sporadic success of these initiatives, and the continuing problems of water overconsumption and pollution in China, reveal the **lack of capacity for consistent and effective enforcement**, with decentralization being a major culprit. Decentralization of political authority in the reform era starting in the late 1970s created the local political incentives and innovation for an economic boom. But it also created a tragedy of the commons in managing the environment and water resources. The incentives to generate local growth have also encouraged protectionism and endemic evasion of environmental standards.

Decentralization has also **weakened local environment agencies**. These already underfunded agencies depend, perversely, on firms continuing to pay pollution fees, which are often too low to act as a deterrent.⁴ Finally, horizontal fragmentation of responsibility for water among multiple departments at the central level has [hindered effective intra-governmental management and coordination](#) of water goals, particularly in river basin management.⁵

In addition to insufficient enforcement capacity, the supply-side solutions offer political and economic benefits, further driving technocratic projects such as hydropower dams. Not only does hydropower construction generate employment and local growth, it has also become integral to energy security goals, and an important part of China's plans to reduce carbon emissions and dependence on coal. China [has pledged to gain 15% of its energy from renewables by 2020](#), which requires a doubling of hydropower output. Politically, ties between the Party elite and state-owned hydro and energy companies have also created vested interests in expanding these sectors.

⁴ Elizabeth Economy, *The River Runs Black: Environmental Challenge to China's Future*, Ithaca, NY: Cornell University Press, 2004; and Dawn Winalski, "Cleaner Water in China – The Implications of the Amendments to China's Law on the Prevention and Control of Water Pollution," *Journal of Environmental Law & Litigation*, Vol. 24 (1), 2009.

⁵ See also Economy, 2004.

Economic growth is still ultimately the end goal of water security. This development imperative is what sustains the ruling Communist Party's political legitimacy and survival, but the Party prioritizes the exploitation of water resources to sustain growth and human activity, rather than curb human activity to sustain water supplies. As a "strategic resource," tied to "economic...ecological...and national security," according to former president Hu Jintao, [water policy has taken on the sensitivity of a national security issue](#). The Chinese state's securitization of water, food, and energy has underwritten an untenable commitment to sovereignty over these resources, to the detriment of water sustainability and relations with Southeast and South Asian neighbours.

The **sovereignty mentality** is also apparent in China's lack of participation or accountability in regional water politics, and given its territorial control of much of Asia's headwaters and its position as a dominant economic power in the region, China has little incentive to engage in multilateral river basin bodies or water-sharing arrangements. China's lack of transparency in hydrological data-sharing from its own dams only fuels neighbours' mistrust. In refusing to join the Mekong River Basin Commission that jointly manages basin resources between downstream states, China also denies riparian neighbours a forum to voice concerns or negotiate multilaterally; instead, its chosen strategy of bilateral negotiations allows it to play its neighbours off against each other, weakening existing regional institutions.⁶ This adherence to sovereignty and unilateralism in China's foreign policy is also evident in its uncooperativeness in global climate change agreements and its reluctance to commit to binding carbon emissions agreements that might hamper its domestic growth.

The **lack of coordination** between China's water management bodies and water resource stakeholders, and conflicting energy and environmental interests, has hindered stronger demand-side solutions and the development of alternative "integrated water resource management" solutions.⁷ Many scientists and experts argue for the need for such integrative approaches, which would institutionalize negotiation and compromise between developmental, human, and ecological needs, and would moderate the negative impacts of dams and other types of water construction; however, this requires far more institutionalization in water management than is currently the case, and establishing this in China's pluralistic, contested political structure will be challenging given the current dominance of economic interests supporting dam and other hydro-developments.⁸

Implications for Canada

A domestic water shortage in China would have ripple effects in the world economy, including Canada. China's water constraints will limit both domestic food and energy production, creating **greater dependence on imported energy and resources**. With 7% of the world's fresh water, Canada will see even more pressure to export this resource – either directly or indirectly – through, for example, exports of water-intensive food and agricultural products.

Canada's role as an exporter of oil to China will also grow significantly, as water shortage constrains China's domestic capacity to exploit its own coal and energy resources. The economic gains for Canada

⁶ Evelyn Goh, "China in the Mekong River Basin: The Regional Security Implications of Resource Development of the Lancang Jiang," in Mely Anthony et al, eds., *Non-Traditional Security in Asia: Dilemmas in Securitization*, Ashgate, 2006, p. 225-246.

⁷ C. J. Vörösmarty et al., "Global Threats to Human Water Security and River Biodiversity," *Nature* 467 (7315), September 30, 2010.

⁸ Zhang Zuo et al., "The Practice of Integrated Water Resource Management in China," presented at Future Information Technology and Management Engineering (FITME) 2010 International Conference.

may involve a trade-off, however, with greater environmental deterioration to the Canadian landscape, as exporting oil to China also comes with environmental costs.

Canada, along with other developed economies, has an interest in supporting China's domestic water sustainability goals. As a country that has been successful in maintaining high water quality standards domestically, Canada can offer funding and scientific expertise to help improve China's demand-side technology, including investment in necessary urban water infrastructure. This would include, for example, high-maturity sewage wastewater treatment facilities that can mitigate problems of urban water pollution. Canada's own institutional and legal frameworks in pollution management and water quality regulation can also serve as a model in developing China's own domestic water management institutions.

As a country rich in hydropower resources, Canada can also play a collaborative role in guiding China's hydropower expansion. Canadian hydro companies have a history with China, and their controversial endorsement of the Three Gorges Dam, in the face of environmental criticism, was instrumental to its construction. As China becomes a world leader in hydropower, Canadian firms can help improve the energy efficiency of Chinese dams; as part of a growing global industry, Canadian hydro companies can also help set established standards and good practice in transparency and public accountability in for dam projects and their local communities.