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Confronting China's Water Insecurity

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Synopsis

With the emergence of water insecurity as a major threat to China's economic growth and social stability, preventive measures should start with reforms to the country's food security.

Commentary

AMONG THE numerous challenges China faces in its quest to become a great power, the biggest perhaps is mounting water insecurity. China has 20 percent of the world's population but only seven percent of the world's fresh water. To make matters worse, the country's scarce water resources are unevenly distributed between the south and north of the country.

With rapid industrialisation and urbanisation, the demand for fresh water is increasing at a very fast rate. It is forecast that by 2030, China's water demand will surpass 800 billion cubic metres. However, China's supply is severely undermined by worsening water scarcity and pollution.

Worsening water scarcity and pollution

Due to over-exploration and inefficient consumption, China's water resources are declining as more rivers disappear and aquifer water levels drop. According to a 2013 report published by the Chinese authorities, the number of rivers in China has decreased from at least 50,000 over a period of 20 years to almost 23,000 rivers in 2011. This means that in the past two decades, China has lost more than 28,000 of its rivers.

Besides, the country's wetlands have shrunk nearly nine percent to make way for massive agricultural production and infrastructure projects since 2003. This is equivalent to an area of 340,000 km² of wetland, an area larger than the Netherlands. As wetlands store a large amount of freshwater resources, receding wetlands means that less water will be available in future.

Also, China's agricultural production and industries are shifting from the southern regions to the central, western, and northern regions where water resources are even scarcer. Unsustainable extraction of underground water has led to the dramatic fall of water levels of aquifers in these regions, in particular, the North China Plain. This region has one of the world's most overexploited groundwater resources - the North China Plain aquifer system. Due to the expansion of the irrigation systems and intensive farming practice, a significant proportion of the shallow aquifer has dropped by more than 20 metres in the past decades, and with some areas experiencing declines of over 40 metres.

China's mounting water shortage is compounded by the high levels of water pollution. According to official statistics, up to 40 percent of China's rivers were seriously polluted in 2012. In the same year, an official survey of 5,000 groundwater checkpoints found 57 percent of water samples heavily polluted. Other reports even claim that groundwater of 90 per cent of cities in China could be polluted.

Potential diplomatic tensions

Certainly, the Chinese government has well realised the gravity of the water shortage issue, and it is taking serious measures to prevent a water crisis. China is spending trillions of yuan on megaprojects such as the South-North Water Diversion project and damming the rivers to boost the country's water supply.

These megaprojects, however, might fail to address China's water shortage. The South-North Water Diversion project is based on the presupposition that the south has surplus water. Yet the severe droughts that hit the southern region in recent years illustrated that the southern region might not have excess water that could be transferred to the thirsty northern region in the future. What is worse, aside from the massive cost, the project is causing huge environmental and ecological damage as the rivers involved have very different ecosystems.

These megaprojects could also adversely affect China's relations with its neighbours. Building dams in the upper reaches of the cross-border rivers (such as Brahmaputra and Mekong) could easily trigger diplomatic tensions. Therefore, China should adopt effective measures to address its water insecurity by curbing consumption and by tackling pollution. Besides, such measures need to target major water consumers and follow the polluter-pays principle.

Agriculture is the biggest consumer of water in China and it currently consumes two-thirds of the country's scarce water resources. Furthermore, agriculture is also the principal polluter to water in China. Researchers found that agriculture is responsible for 44 percent of chemical oxygen demand, 67 percent of phosphorus discharges, and 57 percent of nitrogen discharges into bodies of water.

Balancing water and food security

Undoubtedly, China has put in a lot of effort to reduce water consumption and address problems caused by water pollution. China's policy since 2011 is to focus on water conservancy. China also plans to spend two trillion yuan, or US\$330 billion to tackle water scarcity and water pollution. These measures, however, are overshadowed by China's overarching goal of grain self-sufficiency in its agricultural policy. To boost domestic grain production, China has planned to further expand the areas of irrigated land, which means that the current trend of overexploitation could continue.

Given the extremely low profitability of China's grain sector, to ensure grain self-sufficiency, the country will have to provide heavy subsidies for key inputs include fertilisers, pesticide and water, contributing to water pollution and low irrigation efficiency.

Therefore, to curb water consumption and pollution, China needs to strike a balance between water security and food security. Food self-sufficiency is not equivalent to food security; to safeguard both water and food security of the country, China needs to reform its food security policy. The starting point should be promoting regional and structural adjustments of China's agricultural sector.

To reverse the trend of worsening water scarcity in the north, some areas will have to be taken out of grain production and some areas need to stop planting water-intensive crops such as rice. In addition, China needs to tap the potential of growing grains in those rain-fed provinces to a greater extent.

Next, at the national level, there needs to be a national strategy to fully explore the potential for water conservation by means of virtual water trade across different provinces. At the international level, it is important to recognise food trade not only as an important measure for securing food supply, but also as an important measure for combating water scarcity.

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