

The Chinese dam industry goes out

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China has built more than 23,000 dams at home,¹ with the country's installed hydropower capacity reaching 4.17 gigawatts in 2019. The most famous Chinese dam companies include Sinohydro, Gezhouba, and the Three Gorges Corporation. Since the turn of the century, these companies have been actively building large dams and other kinds of water-engineering projects in Asia, Africa, and Latin America. I will briefly characterize the Chinese dam industry and its role in the possible "resurgence"² of concrete-heavy forms of water management across the world.³

Chinese dam companies are mostly state-owned enterprises (SOEs), corporatized from former government-affiliated organizations. Notably, Sinohydro can be traced back to the head bureau of the country's major water engineering institutes and construction bureaus in the 1980s, including the Gezhouba Bureau. Then, through market-oriented reforms, the Gezhouba Group was established in 1994, independent from the Sinohydro system. All the remaining construction bureaus were corporatized in the 2000s as subsidiary companies of what became known as the Sinohydro Group. Water-



Fig. 1: Ship lock at the Three Gorges Dam. Image in the public domain on Flickr.

related consulting agencies, equipment manufacturing plants, and smaller builders were corporatized too, becoming SOEs at central or provincial levels. The Three Gorges Corporation was created to manage the overall development of the Three Gorges Project – it did not do the actual construction (this was done by Gezhouba and bureaus of Sinohydro) but gained significant experience

in modern project management from planning to operation and maintenance.

While Chinese dam companies retain institutional ties to the Chinese government, the industry has gained technological, managerial and commercial capacities through the building of domestic dams in collaboration with international financiers and peer companies. Since the 1980s, through implementing World Bank-funded projects like the Lubuge and Xiaolangdi dams, Chinese dam players used international standards such as competitive bidding in contracting and adapted international norms for development-induced resettlement into domestic practices. The industry has also learned from international technical exchange and cooperation – for example, in order to build the Three Gorges Dam, Western companies and experts were invited to visit China, while Chinese officials and technicians also attended conferences and visited firms in Western countries.

An unexpected outcome of the international anti-dam campaign⁴ that intensified in the late 1990s against World Bank dam financing, is that it offered the Chinese dam industry an

opportunity to turn overseas. At the time of its establishment in the 1990s, while focusing on domestic projects, the central government gave the Gezhouba Group approval to contract overseas projects and dispatch a workforce, as well as the right to import and export its products. Sinohydro, too, started bidding for foreign construction projects in the 1990s and first won a small contract in Bangladesh in 1998.

The Chinese dam industry has continued to respond to government calls, from the "Going-Out" strategy at the turn of the century to the more recent Belt and Road Initiative. Specifically, although the "Going-Out" strategy and the Belt and Road Initiative are sometimes understood as "strikingly similar,"⁵ the former is a national policy that encourages Chinese companies to invest overseas, while the latter represents a Chinese call for global actions to promote inclusive globalisation.⁶ The 2004 United Nations Symposium on Hydropower and Sustainable Development marked a strong push – by Beijing and others – for hydroelectric dams. Subsequently, the Chinese government agreed to support the dam industry financially. The Chinese dam industry committed to take care of social and



Fig. 2: Ghana's Bui dam, built by China's Sinohydro Corporation, with loans and export credits from the China Exim Bank. Photo by the author, mid-2015.

China's new "River Chiefs"

Mark Wang and Nahui Zhen

Chinese rulers have long understood the critical importance of water in ensuring social stability and their own political longevity. The fight with water in China can be traced back 4000 years, when Yu the Great of the Xia Dynasty is said to have tamed the Yellow River. In contemporary times China has become known as a water conservation giant.¹ It has the most dams in the world, the largest hydropower project (the Three Gorges Dam), and the largest inter-basin water diversion scheme (the South-to-North Water Transfer Project).² The focus of these engineering projects is finding solutions to water supply. While these solutions have to some extent addressed water security problems, they are not only expensive but have also caused profound social-environmental impacts.³ Pollution also remains a key driver of water insecurity and has proved in the past to be an intractable problem. According to China's Environmental Protection Law, the local government is responsible for the environmental governance within their jurisdictions. While the Water Conservation Department supervises and manages water

resources in general and the Environmental Protection Department is responsible for water pollution control, several other departments – e.g., the Housing and Construction, Agriculture, Forestry, Development and Reform, Transportation, Marine and Fishery – participate in the water-related management within their respective responsibilities.

This situation in which the responsibilities for water management are divided into various jurisdictional areas and engaged government agencies was termed as "nine dragons ruling the waters", which is often seen as the root cause of unsatisfactory results in water governance.

In response to current failures, in 2016, the central government required the full establishment of the River (Lake) Chief System (RCS) across the country. Under the RCS, the top officials at different levels of government are appointed as river or lake chiefs within their jurisdiction. The RCS was actually first introduced in Wuxi Prefecture, Jiangsu Province. In 2007, Wuxi was severely affected by a microcystis bloom in Lake Taihu,⁴ leaving more than two

million people without clean drinking water. To deal with the water pollution crisis, the Wuxi government listed water quality of the river/lake sections flowing into Lake Taihu as one of the performance evaluation criteria for local officials. Such a system achieved immediate results in improving water quality in Wuxi and was thereafter quickly promoted to the entire Lake Taihu Basin. By the end of 2018, the RCS was established throughout China: there are now more than 300,000 river chiefs at the provincial, municipal, county, and township levels, and nearly one million river chiefs at the village level.⁵

How does the RCS work? Figure 1 not only shows how the RCS addresses the 'nine dragons ruling the waters' problem, but also shows the key expected outcomes of such a system: clean water, clean rivers, greener riverbanks, and a more beautiful landscape. The four cartoon figures represent different local departments as a lion dancing team following the River Chief's rhythms and beats. The RCS allows the River Chiefs to maximise monetary and personnel resources within their jurisdiction, particularly in mobilising all local officials and departments to work together as a joint force to manage the lakes and rivers, resulting in the 'nine dragons' working for one immediate boss.

While the RCS lays the full responsibility of water pollution and other related issues with River Chiefs in their jurisdiction areas, the River Chiefs' performance is managed by the top-down target responsibility system

of China's Party-state.⁶ The River Chief of the higher-level government evaluates the performance of their lower-level River Chiefs based on whether the water quality along the river sections meets pre-determined targets. These 'hard' targets and other accountability mechanisms are an important driving force for motivating River Chiefs to commit to water protection.

It is too soon to fully evaluate water quality improvements resulting from this system. However, an increasing number of rivers and lakes in China have improved their water quality 'grade', and since the implementation of the RCS, the proportion of water bodies with high water quality has increased. It also seems, however, that the RCS has had uneven results: wealthier regions and regions with stricter environmental restrictions have seen better outcomes from this system and more effective water pollution control.⁷ The RCS enables River Chiefs to mobilise extraordinary administrative resources in a short time, but the sustainability of these results is yet unknown.

Local officials are clearly being made more accountable for local river management. River Chiefs themselves, however, can have limited knowledge about integrated river, catchment, and basin management. Such knowledge gaps may inhibit the RCS's efficacy. The RCS is still in its early stage of development: ongoing evaluation is needed of its long-



Fig. 3: Bui resettlement community. Photo by the author, mid-2015.

environmental issues and engage with other international actors for both domestic and foreign dam projects and governments of project host countries promised to conduct hydropower-related planning and provide appropriate local conditions.

In some cases this came to fruition: Ghana's Bui Dam Project, built between 2008 and 2013 is one example. The China Exim Bank provided the majority of project funding through concessional loans and export credits; Sinohydro served as the Dam's turnkey builder based on the internationally-accepted engineering-procurement-construction format; and the Ghanaian government established the Bui Power Authority as the project owner to manage the overall development of the Bui Dam Project. The Bui Power

Authority in turn hired a British firm for the Dam's impact assessments and resettlement planning, entrusted a French firm to supervise Sinohydro's work, and executed all project-induced resettlement activities. However, in other cases, dam projects with Chinese involvement encountered serious protests against unnecessary social and environmental losses.⁷

In short, the Chinese dam industry is based on complex relations between government and corporations, and has gained considerable capacity through its relations with international peers. The Chinese dam export industry has benefited from the global anti-dam movement. As international financiers stepped away, China's financial institutions continued to sponsor governments

that remained interested in large dams. My previous research shows that China's role in advocating for concrete-heavy forms of water management is highly variegated, influenced by China's broader policies on the one hand and by beneficiary countries on the other.^{8,9} And while activists and NGOs target the Chinese dam industry over specific projects, the global anti-dam campaign continues.¹⁰ All of these forces will continue to shape the future of Chinese dam exports.

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Notes

- 1 <https://www.nature.com/articles/s41597-020-0362-5>
- 2 <http://www.water-alternatives.org/index.php/alldoc/articles/vol10/v10issue2/353-a10-2-3/file>
- 3 Crow-Miller, B. Webber, M. & Rogers, S. 2017. The Techno-Politics of Big Infrastructure and the Chinese Water Machine. *Water Alternatives*, 10, 233-249.
- 4 The international anti-dam campaign started taking shape in the 1980s and was intensified in the mid-late 1990s. Remarkably, given massive dam-induced social and environmental impacts, in 1994, 326 civil society organisations from 44 countries signed the *Manibeli Declaration: Calling for a Moratorium on World Bank Funding of Large Dams*, and then in 1997, activists and dam-affected people from over 20 countries gathered and released the *Curitiba Declaration*, extending the *Manibeli Declaration*, urging the World Bank to stop funding big dam projects. The World Commission on Dams, established in 1998 and sponsored by IUCN and the World Bank, features one of the major official responses to the campaign. Find more at: <https://www.wri.org/publication/watershed-global-governance-independent-assessment-world-commission-dams>
- 5 Cabestan, J.-P. 2019. Beijing's 'Going Out' Strategy and Belt and Road Initiative in the Sahel: The Case of China's Growing Presence in Niger. *Journal of Contemporary China*, 28, 592-613.
- 6 Liu, W. & Dunford, M. 2016. Inclusive globalization: Unpacking China's belt and road initiative. *Area Development and Policy*, 1, 323-340.
- 7 <https://www.scmp.com/lifestyle/article/3003172/green-activists-vow-fight-and-stop-china-backed-us15-billion-sumatra-dam>
- 8 Han, X. & Webber, M. 2020a. Assembling dams in Ghana: A genealogical inquiry into the fluidity of hydropolitics. *Political Geography*, 78, 102126.
- 9 Han, X. & Webber, M. 2020b. Extending the China water machine: Constructing a dam export industry. *Geoforum*, 112, 63-72.
- 10 <https://www.rivers4recovery.org/>

term effects on China's water pollution and ecological restoration.

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- 1 <https://www.nature.com/news/sustainability-transfer-project-cannot-meet-china-s-water-needs-1.18792>
- 2 https://www.water-technology.net/projects/south_north/
- 3 <https://www.sciencedirect.com/science/article/pii/S0301479720312639?via%3Dihub>
- 4 https://e360.yale.edu/features/on_lake_taihu_china_moves_to_battle_massive_algae_blooms#:~:text=In%20May%202007%2C%20a%20massive,drinking%20water%20for%20a%20week.&text=Workers%20clean%20algae%20at%20drinking,Wuxi%20city%20on%20Lake%20Taihu
- 5 http://www.xinhuanet.com/fortune/2019-01/15/c_1123994315.htm
- 6 <https://journals.sagepub.com/doi/10.1177/0920203X20920514>
- 7 She Y, Liu Y, Jiang L, et al. Is China's River Chief Policy effective? Evidence from a quasi-natural experiment in the Yangtze River Economic Belt, China. *Journal of Cleaner Production*, 2019, 220: 919-930



Fig. 1: China's river chief system. Courtesy CSRCARE.