China Dams the World: The Environmental and Social Impacts of Chinese Dams

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China's rapid economic growth has created a series of pressures that has forced the country to engage more closely with a number of low and middle income countries. First, rapid growth is depleting scarce domestic natural resources, including energy resources and minerals, and so part of China's 'Going Out Strategy' encourages overseas investment to access these resources (Mohan and Power, 2009; McNally et al, 2009; Urban and Mohan, 2011). Secondly, as some sectors of the Chinese market become relatively saturated, the first generation of large state-owned enterprises (SOEs) liberalised under the post-1979 reforms need to internationalise and acquire new markets (Huang, 2008). Thirdly, China's rapid technological advances – such as in energy technology- have made it possible to expand overseas. These three drivers – resource access, new markets, technological advances– come together in the hydropower sector where China is the pre-eminent global player in major dam projects, often with the support of Chinese state finance (Bosshard, 2009; Urban and Mohan, 2011).

Large dams have been controversially debated for several decades due to their large-scale and often irreversible social and environmental impacts (WCD, 2000). In the pursuit of low carbon energy and climate change mitigation, hydropower is experiencing a new renaissance in many parts of the world, despite its vulnerability to climate change and increased water stress (IPCC, 2011). At the forefront of this renaissance are the Chinese, the world's largest dam builder. Sinohydro, a Chinese state-owned enterprise (SOE), is leading the global hydropower sector in terms of number and size of dams built, investment sums and global coverage. While China has a long history of domestic dam-building, recent developments have led to rising numbers of Chinese overseas hydropower dams, particularly in low and middle income countries in Asia and Africa (Bosshard, 2009; McDonald et al, 2009; International Rivers, 2012). Power generation equipment is now China's second largest export earner after electrical appliances (Bosshard, 2009). Other motives include China's search for overseas job creation for Chinese workers and for providing the infrastructure for larger resource extraction projects (Bosshard, 2009), for example, in planned aluminium industries at the Bakun dam site in Borneo, Malaysia.

Chinese Dams Go Global

Under the new Chinese leadership of Xi Jinping and Li Keqiang, hydropower plays an important role. The 12th Five Year Plan, covering the period from 2011 to 2015, foresees a domestic expansion of hydropower. The plan outlines the construction of major dams on key watersheds such as the Jinsha, Yalong and Dadu Rivers, and commencing the construction of new hydropower dam projects with a total installed capacity of 120 GW (China-Britain Business Council, 2011).

With regards to Chinese overseas dam projects, there are currently 304 Chinese overseas dams, most of them in Southeast Asia (38%) and Africa (27%). The large majority of these are large dams that have been built after 2000 (International Rivers, 2014), at a time when many other dam-building nations and organisations, particularly those from the OECD, were withdrawing from the dam-building industry.

Chinese dam-builders differ from other dam builders due to their bundling of aid, trade and investments; the role of state-owned enterprises (SOEs) that are backed by abundant state funding; their own distinctive way of handling

(and not seldom, disregarding) social and environmental impacts; their pragmatic approach to regional politics and political alliances and their need for access to natural resources (Urban et al, 2013; Hensengerth, 2013; see also Tan-Mullins and Mohan, 2013).

The Mekong River and its tributaries have become a major development site for China's dam-builders in recent years. China's neighbouring countries Laos and Myanmar aim to export electricity from the Chinese dams back to China. Laos has even named itself the ''battery of Asia" and aims to export a large share of its electricity to neighbouring countries like China and Thailand, rather than using it domestically. In the coming years, Laos aims to increase its hydropower production capacity to 30,000 MW from 670 MW in 2008/2009 (Jönsson 2009). Along similar lines, Cambodia's Minister of Public Works and Transport, Khy Tainglim, was quoted as follows: "'Water is our oil […] and we should use our water to export and get foreign currency to develop the country" (cited in Goh, 2004: 7).

The rise of hydroelectricity as a source of income and development however comes at a cost. While the country may overall benefit from cheaper electricity supply and increased domestic energy security, the social cost is born by the local communities, whose livelihoods are negatively affected, as well as the local environment that is adversely affected.

The Case of Cambodia

In Cambodia, Sinohydro built the 193 MW Kamchay Dam in Kampot Province, which started operation in late 2011. The Kamchay Dam is the first large hydropower dam in Cambodia and its generating capacity is much needed in a country where only about 30% of the local population had access to electricity in 2010 (World Bank, 2013). The dam cost an estimated US$280 million, financed by China's Export Import (ExIm) Bank. There are a range of reported environmental issues, including late Environmental Impact Assessment (EIA) approvals that came after the dam was almost completed; dam construction in Bokor National Park, home to several endangered species including tigers; and flooding of protected forests (International Rivers 2013a; NGO Forum, 2013). There are also several social issues related to negative impacts on the livelihoods of local communities, particularly for poor bamboo collectors who depended on the flooded forest for their daily income and who have no alternative sources of income or livelihoods; a patchy consultation processes (International Rivers, 2013); unresolved complaints from the local population; and non-transparent decision-making and communication processes between Sinohydro and the Cambodian authorities (NGO Forum, 2013). Ironically, some villagers who live just next to the Kamchay Dam do still not have access to electricity as it is being exported to Phnom Penh.

Even more dramatic and controversial than the Kamchay Dam is however the building of the Lower Sesan 2 Dam in Stung Treng Province. The 400 MW dam, with an estimated cost of almost US$820 million, is implemented by Hydropower Lower Sesan 2 Co. Ltd.,a joint venture between Cambodia's Royal Group and Chinese dam-builder Hydrolancang International Energy Co. Ltd (90%),and EVN International Joint Stock Company, a subsidiary of the Electricity of Vietnam (EVN) (10%). Hydrolancang International Energy has a poor reputation in China for its domestic social and environmental violations (International Rivers, 2013b). It is estimated that thousands of villagers will have to be resettled for the Lower Sesan 2 Dam as their land will be flooded, and many more will see their livelihoods and their food security threatened. Severe changes are expected to fisheries and irrigation for rice farming both up-stream and down-stream of the dam due to expected changes in fish populations and water flow, impacting the "rice bowl of Asia", which stretches over large parts of Cambodia as well as neighbouring Thailand, Vietnam and Laos (International Rivers, 2013b). There have been numerous calls to halt the dam construction (International Rivers, 2013b), due to concerns about the EIA failing to meet international best practice, the lack of consultation of local people and non-transparency with regards to resettlement plans.

As the examples from Cambodia indicate, China's dam-building in the Greater Mekong Sub-Region is not only a challenge for the host country, but creates also wider international and trans-boundary concerns, particularly for neighbouring countries who share the same watershed.

Consequences Downstream

One can speculate that by off-shoring hydropower dams to neighbouring countries, China may reduce some of the environmental and social consequences of these dams domestically. Hydropower dams seem to have indeed become increasingly unpopular in China. The Chinese Three Gorges Dam included the flooding of 13 cities, 140 towns and 1,350 villages as well as numerous sites of cultural, historic and religious heritage. As a result, 1.3 million inhabitants were relocated, many from rural areas to cities (DTK 2002; International Rivers 2008a). It has been reported that many subsistence farmers and fishermen were relocated to cities, or they received tiny slots of barren land as compensation. In total, China's domestic dams are reported to have displaced 23 million people as well as significantly affected water availability and environmental quality (International Rivers, 2012b).

Several leading members of China's water resources bureaus have expressed concerns on the number of dams in China's Southwest: Mr Weng Lida, the former Director General of the Yangtze Valley Water Resources Protection Bureau has commented: "There are too many dams on the rivers in the southwest, the rivers can hardly breathe." (International Rivers, 2012a:1). The Sichuan Geology and Mineral Bureau even published a study that claims that the Yangtze River might in the long term run dry as dam developers are planning to build excessive numbers of large dams (International Rivers, 2012a). After the experience of the Three Georges Dam, some large hydropower projects have been stopped in China due to domestic and international opposition. Considering these high social and environmental costs, it seems understandable that China is interested in investing in large hydropower projects outside of its own borders. Investing in large hydropower projects in Cambodia, Laos, Myanmar, Vietnam and Thailand enables Chinese corporations such as Sinohydro to make profits and create employment, while some dams will enable China to import cheap low-carbon electricity to China's booming cities, sparing China's own rivers and its populations from considerable adverse effects (Urban et al, 2013). Moreover, many of the large Chinese-financed dam projects around the world are relying on a predominantly Chinese workforce (particularly in Africa), Chinese technology and Chinese companies, which overall has limited benefits to local economies (Compare Houser, 2008).

In conclusion, China's growing hydropower investments are in part motivated by its energy needs, revenue and employment creation, as well as to build visible signs of the economic cooperation between China and other developing countries in Southeast Asia. In this respect, the development of the Mekong River and its tributaries serves as a tool for regional power relations and the development of an infrastructural network between China and its neighbours. Strategic interests and energy security seem therefore the prime motivations for this investment. While the development of water resources for long-term economic development is also a motivation for Southeast Asian countries, it is important to view the dams in the context of the existing power disparities between China and countries along the Lower Mekong River and its tributaries. In Cambodia, for example, China is a donor, investor in infrastructure projects such as roads and bridges, as well as a trading partner (Goh, 2004). Dams are often part of aid-trade-investment packages that China is providing to foreign governments. This creates complications for affected countries in expressing concerns over the ecological and social impacts of the construction of dams along the Mekong River and its tributaries. In addition, Chinese dam-builders tend to invest in countries and regions where other multilateral organisations have often stopped hydropower developments. China thereby offers opportunities for bringing infrastructure, modern energy technology, resources and investments to poor and deprived countries (Urban et al, 2013).

Despite (or maybe due to) these opportunities, Chinese dam-builders are more exposed to international scrutiny than ever before. The global media, international NGOs, foreign governments, donors, firms and researchers alike have fixed their eyes firmly on China's overseas dam developments. In the long-run, Chinese dam-builders will therefore need to improve their environmental and social practices to increase the sustainability of their dams, both domestically and overseas.

References

Bosshard, P. (2009). China dams the world. *World Policy Journal,* 10, 43–51.

China-Britain Business Council (2011). China's 12th Five Year Plan. English translation.
http://www.britishchamber.cn/content/chinas-twelfth-five-year-plan-2011-2015-full-english-version

DTK German Dam Committee. (2002). The Three Georges project at the Yangtze: Provisions and reality. http://www.talsperrenkomitee.de/info/index.cgi/page/three_gorges.

Goh, E. (2004). China in the Mekong River Basin: The regional security implications of resource development on the Lancang Jiang. Nanyang Technological University. http://dr.ntu.edu.sg/bitstream/ handle/10220/4469/RSIS-WORKPAPER_73.pdf?sequence=1.

Hensengerth, O., 2013.'Chinese hydropower companies and environmental norms in countries of the global South: the involvement of Sinohydro in Ghana's Bui dam'. *Environment, Development and Sustainability*, Vol. 15 (2): 285-300.

Houser T., 2008. The Roots of Chinese Oil Investment Abroad. *Asia Policy* (5): 141–66

Huang, Y. (2008) Capitalism with Chinese Characteristics: Entrepreneurship and the State, Cambridge: Cambridge University Press.

International Rivers. (2008a). The Three Gorges Dam: The cost of power. http://www.internationalrivers.org/files/3Gorges_factsheet.lorez_.pdf.

International Rivers. (2008b). Delegate calls for Tiger Leaping Gorge rethink. http://www.internationalrivers.org/files/DelegateCalls.pdf.

International Rivers. (2012a). New wave of Three Gorges-sized dams raise old fears. http://www.internationalrivers.org/blogs/246/new-wave-of-three-gorges-sized-dams-raise-old-fears

International Rivers. (2012b). China's major rivers. http://www.internationalrivers.org/campaigns/china-s-major-rivers

International Rivers (2013a). Hydropower dams in Cambodia. http://www.internationalrivers.org/campaigns/cambodia

International Rivers (2013b). Lower Sesan 2 Dam. http://www.internationalrivers.org/campaigns/lower-sesan-2-dam

International Rivers (2014) List of China's overseas dams. Available at http://www.internationalrivers.org/resources/china-overseas-dams-list-3611

IPCC Intergovernmental Panel on Climate Change (2011). Special Report on Renewable Energy Sources and Climate Change Mitigation. Summary for Policy-Makers. http://www.uncclearn.org/sites/www.uncclearn.org/files/inventory/ipcc_summary_for_pm.pdf

Jönsson, K. (2009). Laos in 2008: Hydropower and flooding (or Business as Usual). *Asian Survey*, 49(1), 200–205.

McDonald, K., Bosshard, P., & Brewer, N. (2009). Exporting dams: China's hydropower industry goes global. *Journal of Environmental Management*, 90, S294–S302.

McNally, A., Magee, D., & Wolf, A. T. (2009). Hydropower and sustainability: Resilience and vulnerability in China's powersheds. *Journal of Environmental Management,* 90, 286–293.

Mohan, G., & Power, M. (2008). New African choices? The politics of Chinese engagement. *Review of African Political Economy*, 115, 23–42

NGO Forum Cambodia, 2013. The Kamchay Hydropower Dam: An Assessment of the Dam's Impacts on Local Communities and the Environment. NGO Forum, Phnom Penh.

Tan-Mullins, M. and Mohan, G. (2013). The potential of corporate environmental responsibility of Chinese state-owned enterprises in Africa. *Environment, Development and Sustainability*, 15(2): 265–284.

Urban, F., Nordensvärd, J., Wang, Y., Khatri, D., 2013. An analysis of China's investments in the hydropower sector in the Greater Mekong Sub-Region. *Environment, Development and Sustainability*, Vol.15(2):301-324.

Urban, F. and Mohan, G., 2011. Case for Support: China goes global. Economics and Social Research Council ESRC, Swindon.

WCD World Commission on Dams (2000). Dams and Development: A new framework for decision-making. Earthscan, London.

World Bank, 2014. World Development Indicators WDI. http://www.worldbank.org/

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