Energy Policy 115 (2018) 561–571

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Capturing the rains: Comparing Chinese and World Bank hydropower projects in Cameroon and pathways for South-South and North South technology transfer☆,☆☆

Yunnan Chen[a,*], David Landry[b]

[a] SAIS China Africa Research Initiative (CARI), Johns Hopkins School for Advanced International Studies, 1740 Massachusetts Avenue NW, Washington, D.C., United States

[b] Johns Hopkins School for Advanced International Studies, Washington, D.C., United States

ARTICLE INFO

Keywords:
China
Africa
Development
Hydropower
Technology transfer
Environment
South-South cooperation

ABSTRACT

China is an increasingly prominent actor in infrastructure development in the Global South. Hydropower, as a renewable energy source, is a key area in which Chinese technological cooperation and finance can contribute to sustainable growth. However, many of China's overseas hydropower projects remain controversial for their social and environmental impacts.

This paper presents a comparative case study of a China Exim Bank-financed project and a World Bank-led multilateral project – both located in Cameroon – to highlight the commonalities and differences between China as a rising power and "traditional" Northern donors in the field of hydropower development. It examines the financiers' influence on tendering, financing and implementation, as well as pathways of technology transfers undertaken. While both projects adhere to domestic regulations, the rigor of norm-enforcement and the level of involvement from financiers differ considerably, with implications for the projects' construction, labor-relations and potential for technology transfers.

This study contributes to the understanding of the developing norms and practices surrounding environmental and social impact management and technology transfers in South-South cooperation by engaging in a comparison of China, a rising power, and "traditional" donors such as the World Bank, who are re-emerging in the field of infrastructure development.

1. Introduction

The need for cleaner, more sustainable pathways for development is increasingly apparent across the developing world, where the impacts of climate change are often disproportionately borne. Northern donors are now recognizing this phenomenon, which has had impacts at the multilateral level, as shown the UN Sustainable Development Goals (SDGs). This also has key implications for the engagement of emerging powers such as China, whose expertise in sectors such as hydropower and renewable energy can make significant contributions to sustainable development in the global south. China's "going global" policy has led to an increasing internationalization of Chinese enterprises. This has accelerated in recent years as China's domestic boom resulted in overcapacity, especially in the construction and industrial sectors. Chinese construction firms are now increasingly competing for international contracts, often with the support of financial instruments from state policy banks.

In Africa, Chinese investments in energy and natural resources have attracted much attention. Chinese projects are accused of disregarding negative social and environmental impacts, neglecting workers' rights, as well as having a general lack of regard for transparency norms. China ramped up its development finance for infrastructure development in Africa at the turn of the millennium, at a time when traditional donors and multilateral development banks (MDBs)—including the World Bank—were shying away from large infrastructure finance, partly due to their environmental and social risks. However, over the last decade, the number of World Bank-financed dams has risen dramatically, as MDBs once again recognize the importance of energy infrastructure for development.

This paper examines the case of Cameroon, where both China

☆ This article is part of a Virtual Special Issue entitled 'South-South Technology Transfer and Cooperation for Low Carbon Energy Technologies.

☆☆ Fieldwork research for this paper was conducted with generous support from the China Africa Research Initiative under an award from the Carnegie Fellowship program, grant no. B 9041.

* Corresponding author.
E-mail addresses: y.chen@jhu.edu (Y. Chen), davidglandry@jhu.edu (D. Landry).

https://doi.org/10.1016/j.enpol.2017.11.051
Received 3 August 2017; Received in revised form 16 November 2017; Accepted 24 November 2017
0301-4215/ © 2017 Elsevier Ltd. All rights reserved.

Eximbank and the World Bank have actively financed hydropower projects. Cameroon has the second highest hydropower generation potential in Africa, which remains largely undeveloped. In recent years, the government has sought to leverage various foreign sources of finance to build up its hydroelectric capacity. We comparatively evaluate two hydropower projects, looking at the role and influence of Northern and Southern development partners in financing and delivering energy infrastructure, managing environmental impacts, and promoting pathways for technology transfers. We highlight several key differences between the two projects, their respective financiers' regulation and enforcement of environment and social standards, and their modes of technology transfer and diffusion.

Our analysis highlights complementary roles for Northern and Southern financiers in developing Cameroon's hydroelectric infrastructure, though they present diverging approaches to project management. Both projects adopted international standards around environmental and social impacts, but disparities exist in their enforcement mechanisms and in their institutional relations with the Cameroonian government. This has implications for the depth of the technology transfers that occur. Technical transfers and skills training by Chinese firms are common in both projects. However the institutional embedding of the World Bank led to additional 'soft' technology transfer and capacity building that may entail longer-term benefits than the turnkey model of the Chinese-financed project.

The paper is structured as follows: we first review the literature surrounding the historical role of the World Bank and China, as Northern and Southern development actors, in financing hydropower projects. We then provide an overview of Cameroon's energy and water context, focusing on two projects—Memve'ele, financed by China Eximbank, and Lom Pangar, financed by a World Bank-led consortium. We compare the financiers' decisions surrounding project finance, contracting, and implementation, their respective environmental and social standards, and their relationships with host institutions. The paper concludes with policy recommendations for Chinese actors, the World Bank and MDB donors, as well as host country governments.

2. Literature review

The entry of the "rising powers" into the global development arena has led to a new discourse on "South-South" cooperation that claims to be materially and ideationally distinct from the "North-South" relations of the post-war world order (Mawdsley, 2017). China's development cooperation and its broader foreign policy share the principles embodied in South-South Cooperation—including norms of national sovereignty, non-conditionality, and non-interference in domestic affairs (Zhang et al. 2015). However, the growth of Chinese development finance has generated fears that it is undercutting Western donors, and undermining norms of good governance. China's development finance has earned it the label of "rogue donor", which only offers assistance when the natural resources of receiving countries are at play (Naim, 2009). In reality, the connection between Chinese development finance and natural resources is far more tenuous (Dreher and Fuchs, 2015).

China's importance as a provider of development finance has accelerated since 2000. China's loans to African governments alone have risen from a total of USD 121 million in 2000 to USD 13.5 billion in 2014 (China Africa Research Initative 2017). Of this sum, USD 13.1 billion was disbursed to countries in sub-Saharan Africa. In comparison, the World Bank Group's total commitment to sub-Saharan Africa that year was USD 15.1 billion, up from USD 14.7 billion the year before (World Bank 2014). According to the GOC, China is the single largest lender to Cameroon, with loans totaling CFA 139 billion (around USD 242 million) (Gouvernement du Cameroun, 2015).

The rise in development finance from Southern actors has provoked an urgency on the part of Western donors to integrate these new actors into existing international frameworks (Eyben and Savage 2013). While China has responded cooperatively to Northern engagement, the balance of global economic power has shifted: the establishment of new Southern-led initiatives such as the Belt and Road Initiative, the New Development Bank and the Asian Infrastructure Investment Bank highlight China's new financial heft and international assertiveness (Chin 2016). Importantly for recipients of development finance, this trend has resulted in a greater focus on hard infrastructure as a lynchpin for economic development—at a time when traditional donors had largely shied away from infrastructure finance.

The recent history of hydropower finance highlights the divergent approaches of Northern and Southern development actors. Despite its green credentials—being a renewable energy source and a clean development mechanism (CDM)—hydropower represents a controversial area for Northern development finance, due to its high-risk and high-impact nature. The capital-intensive nature of large-scale hydropower projects presents institutional risks for corruption, and its dependence on external loan financing in turn raises questions over debt sustainability. Hydropower is also controversial due to its negative spillovers, both environmentally for affected riverine ecosystems, and socially for local displaced communities.

The World Commission on Dams (WCD) in 2000 gave a somber assessment of the benefits of dams. While the Commission, in the words of Moore et al., was "an experiment in multi-stakeholder dialogue and global governance"—including representatives from civil society, government, the private sector, IFIs and scientific communities—the 26-point guidelines it generated were the subject of "conflict and controversy" (Moore et al., 2010). The report concluded that, while dams made "an important and significant contribution to human development", the benefits did not outweigh the outsized social and environmental costs of dam construction borne disproportionately "by people displaced, by communities downstream, by taxpayers and by the natural environment" (ibid, p.xxvii; World Commission on Dams, 2000, p.xxxi). Even with World Bank projects, compensation plans were often insufficient to allow resettled populations to regain their previous living standards (Scudder, 2001).

The timing of the WCD report coincided with the cancellations of a number of controversial World Bank projects, including the Sardar Sarovar dam in India and the Arun III project in Nepal. It cemented a retreat of the international financial institutions away from large infrastructure projects for much of the following decade (Clark et al., 2003). To critics, the report was seen as a detrimental shift away from important infrastructure finance for countries struggling to build national energy capacity. It was also accused of giving too much weight to the views of anti-dam NGOs and lobbying groups against the wishes of elected developing country governments (Briscoe, 2010).

While Northern donors were moving away from hydropower, Southern players—most notably China—were ramping up their investments. As a historically water-scarce country, China built huge domestic capacity in dam construction and water management, with strong political backing (both former President Hu Jintao and Premier Wen Jiabao were formerly trained hydro-engineers). Currently, half of the world's mega-dams are located in China—most notably the Three Gorges Dam, the largest dam in the world—many of which have been criticized for their environmental impacts and massive social displacement.

China's involvement in dam construction became increasingly visible in Africa in the 2000s, with prominent projects such as Imboulou in the Republic of the Congo, the Bui Dam in Ghana, the Merowe Dam in Sudan, and the Gibe III project in Ethiopia. While International Rivers reports that 330 dams worldwide were built by Chinese firms, analyses based on such media reports are often exaggerated (International Rivers, 2017). Close examination by the China Africa Research Initiative (CARI) has shown that, while International Rivers claim over 30 Chinese dams in Africa, in reality only 17 hydropower projects in Africa have Chinese financing (Hwang et al., 2015). Regardless, these projects have attracted scrutiny in the media and by civil society actors for their economic, environmental, and social impacts

(Bosshard, 2008; McDonald et al., 2009).

Advocacy groups have been concerned over the prospect of Chinese contractors "exporting" domestic practices to other countries (Urban, 2015). That said, a comparative study of the Eximbank-financed and Sinohydro-constructed Bui dam in Ghana and Kamchay project in Cambodia finds that host governments have a larger influence in determining the projects' standards than the contractor itself (Urban et al., 2015; Hensengerth, 2011). Another study of the Bui dam highlights Sinohydro's limited role in managing social and environmental management plans, though it raises questions regarding labor conditions as part of project construction (Kirchherr et al., 2016).

As Chinese firms' international presence has grown, China's domestic norms surrounding dam construction have also evolved (McDonald et al., 2009). At the state-level, China Eximbank has developed an environmental policy that requires companies operating overseas to conduct environmental impact assessments and project reviews before (as a condition for approval), during, and after the construction of a project (International Rivers, n.d.). At the firm level, Chinese firms have also evolved in their approach to corporate social responsibility. Sinohydro developed new standards for social sustainability in 2011, which were adapted from World Bank safeguard policies (though newer updates to this policy after the company's restructuring appear to reflect weaker commitments) (World Bank Social and Environmental Impact Assessment 2017).

There has been a revival in infrastructure finance among Northern donors such as the World Bank, with the successful Nam Theun II project in Laos serving as a turning point. Since the 1990s, the proportion of World Bank lending to infrastructure doubled from 20% to 40% (Briscoe, 2010, p.411). The 2009 Directions in Hydropower document committed the World Bank to scaling up hydropower, and new directives in 2013 outlined its future strategy to move away from coal towards hydropower and natural gas projects (World Bank, 2013). The creation of the Global Infrastructure Facility at the World Bank also points to its drive towards infrastructure investment, and a greater prioritization of dam projects (World Bank, 2015). However, there has been concern that the consolidation of World Bank's Social and Environmental Framework that began in 2012 may lead to a 'watering-down' of its safeguards policies regulating infrastructure finance, even as it ramps up the latter (World Bank, 2016).

The entry (and re-entry) of Southern and Northern donors in the field of hydropower finance carries huge benefits for developing countries, where energy constraints are a bottleneck to economic growth and development. External financing from China is an opportunity for low-income countries to obtain new, low-carbon technologies that they would otherwise be unable to finance domestically (Urban et al. 2015; Watson et al. 2015). Infrastructure projects may also be channels for technology transfer, and act as catalysts for technological upgrading in the economy through the transfer of hardware, knowledge and skills. Technological diffusion can also occur through the transfer of skills and 'know-how' through employment and training of locals, upgrading the level of human capital. On this front, China as a development actor has engaged in many forms of training and skills transfer initiatives in health, vocational education, and government sectors, as well as through student exchanges and scholarships, much of it driven by discourses of 'south-south cooperation' (King 2013). Aside from direct training and knowledge transfer, technological diffusion has been shown to occur through the backward and forward linkages generated by new supply chains, as foreign investors partner with domestic firms and suppliers (Wahab et al., 2011). These economic linkages were an instrumental mechanism in the rise of China's manufacturing sector (Liu 2008).

The success of such transfers may crucially depend on the local institutional context and absorptive capacity of recipient countries, and the linkages that foreign actors form with the domestic economy (Urban et al. 2015; Winkler 2013). Much criticism of Chinese investments in Africa has been aimed at the alleged importation of Chinese labor, and the emergence of Chinese 'enclaves', which offers little benefit to the domestic economy or local employment (Mohan, 2013). They also matter to the long-term sustainability of infrastructure projects. In the case of China's earlier infrastructure projects, like the Tan-Zam railway, lack of resources and human capital were contributing factors to the project's decline and disuse. Such "soft" technology transfers are essential to the economic viability of infrastructure projects, including hydroelectric dams, as the successful operations and maintenance of projects depend on sufficient skills and localization of knowledge and expertise, not just the transfer of hard technology (Urban et al. 2015).

3. Hydropower in Cameroon's energy strategy

Cameroon possesses the second highest hydropower generation potential in Sub-Saharan Africa after the Democratic Republic of Congo—roughly 12,000 MW—but much of it remains undeveloped (World Bank 2014). Currently, only 25% of rural households have access to electricity, and just over 50% of urban households are connected to the electrical grid (ibid.). Foreign investment and expertise in hydropower could make a powerful contribution to the country's energy security, and promote sustainable development. At present, the country is approximately 70% dependent on hydropower sources from three major hydropower dams: Song Loulou, Edea and Lagdo (see Fig. 1). Industrial actors consume much of this energy, notably the Alucam smelter near Edea. The government of Cameroon (GOC) aims to expand domestic power generation to 10,000 MW by 2018, largely via the development of both thermal and hydropower capacity though a new thermal gas plant at Kribi and future hydropower projects in the Sanaga basin, including Song Ndong, Song-Mbengue, and Nachtigal.

4. Research questions and methodology

This paper employs a comparative case study approach to examine the respective approaches of two donors in two projects: the Eximbank-financed Memve'ele hydroelectric dam, and the Lom Pangar project, financed by a World Bank-led consortium. Focusing on a single country creates a constant—or country "fixed effects" in the intervening variable of host country institutions—and helps to isolate the effect of external financiers as the independent variable of interest. This also allows for comparability when examining the host-country's interactions with external actors.

Our comparative analysis centers around the following questions:

1. Given that both Northern and Southern sources of finance were available during this time, what factors drove the Government of Cameroon (GOC) to select Chinese and World Bank financing for the Memve'ele and Lom Pangar projects, respectively? What were the motivations behind the financiers' decisions to fund their respective projects?
2. How do the projects differ in terms of implementation, and in their social and environmental impact mitigation standards and strategies? What role does the financier play in applying and enforcing these standards?
3. What are the processes of technology transfer that occur within the two projects, and what roles did the Northern and Southern financiers play in driving these processes?

Memve'ele and Lom Pangar are two of several hydropower and dam projects that have been planned across Cameroon, and they offer a credible point of comparison along several lines. First, the financing and contracting for both projects took place within a similar timeframe. This means we can assume some consistency in the institutional context, and even with regards to the policymakers that helped bring the projects to life.

Second, though the nature of the projects is qualitatively different—one is a run-of-river dam, and the other a regulating dam—both

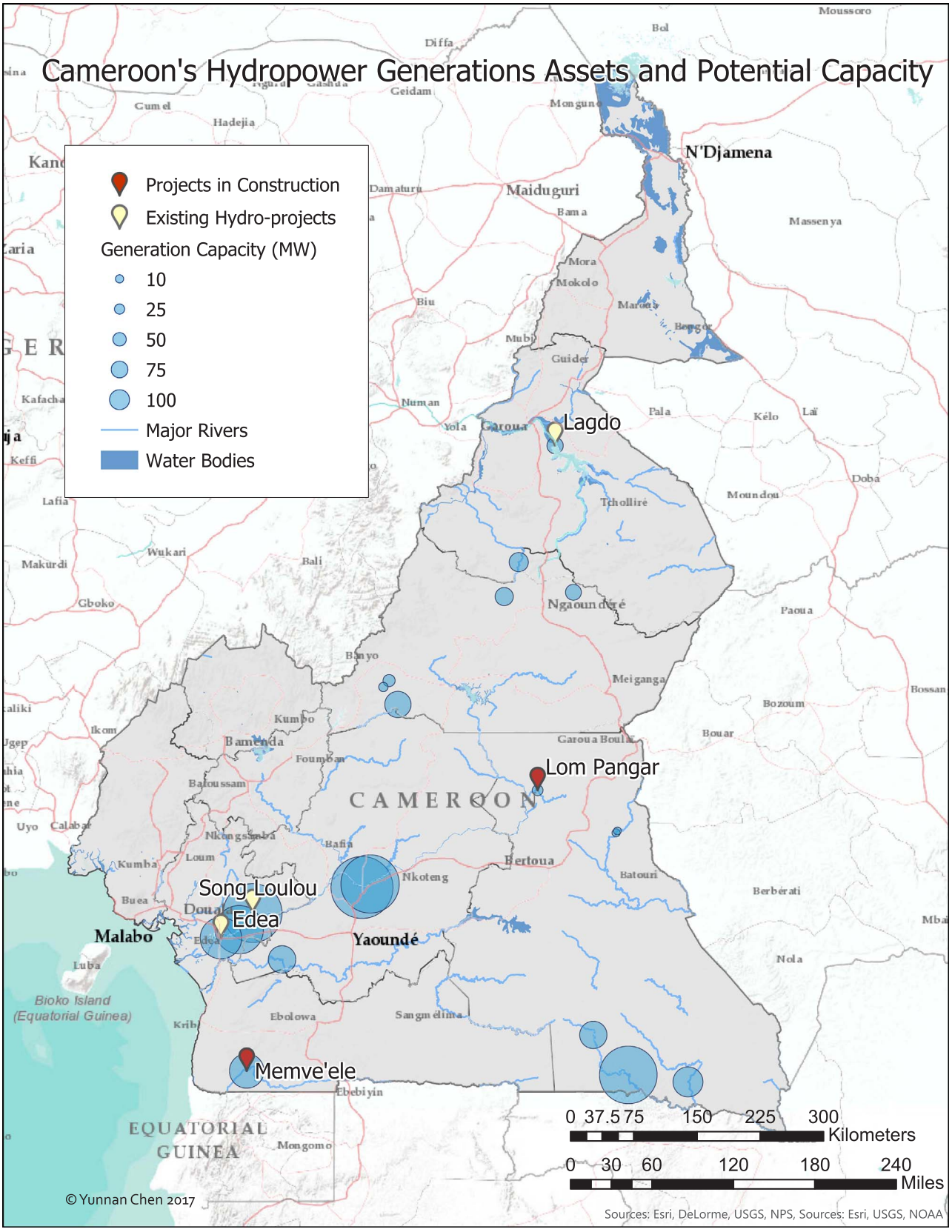

Fig. 1. Map of Cameroon's hydropower Projects.

are of similar scale in costs, making them comparable in terms of financial risks. Though other hydropower projects, such as Mekin, were constructed in the same period, they operate on a much smaller scale, and less information is available on their financing compared to Lom Pangar and Memve'ele. Therefore we did not consider them for our analysis.

Our research employs a process-tracing approach to understand the chronology of the two projects and identify the actors and decision-makers involved in their design, finance and construction phases. In addition to a secondary literature review and online research, this paper draws on fieldwork comprising 18 elite interviews conducted in Cameroon in early-2016. Interviews were held with Chinese contractors, representatives from relevant Cameroonian government ministries, project management offices, and with World Bank and multilateral actors. One follow-up interview was conducted in Washington, DC in the spring of 2016. Interviews were conducted in English, French, and Mandarin Chinese. We began the process through initial contacts with the China Ministry of Commerce (MOFCOM) counsellor's office in Yaoundé, the World Bank's office in Yaoundé, and with the Prime Minister's Office. From there, snowball sampling was used to identify additional contacts in relevant agencies. One researcher conducted a site visit to the Memve'ele project to observe construction and interview the company director, and observe local and Chinese staff on site.

This methodology enables us to compare the two projects with regards to their implementation and in terms of social and environmental impact mitigation strategies, and allows us to gain a better grasp of the factors that motivated the Cameroonian government to proceed with the projects and their respective financiers, and the benefits and drawbacks it perceived from doing so. That said, our methodology has limitations: relying on interviews did not allow us to understand the two projects' respective social impacts from the point of view of the populations affected. In other words, the elite interviews we conducted provided us with an overview of the projects from the financiers and the Cameroonian government's perspectives, rather than one from "from below".

5. Case studies

5.1. Projet Memve'ele

The Memve'ele project is a 210 MW (MW) run-of-river dam and hydroelectric generator plant located on the Ntem river, in the southern littoral region of Cameroon. The project is expected to add 210 MW (MW) to Cameroon's electrical grid. Sinohydro's 16th Bureau was selected as contractor through an Engineering, Procurement and Contracting (EPC) model. Construction began January 2013 and was estimated to be 74% complete at time of our fieldwork. Though the project was expected to be complete in 2017, its commission has been delayed by the lack of transmission lines to the energy grid.

5.1.1. Funding

The total cost of the dam is estimated to be USD 637 million—85% of it is financed by China Eximbank, and the other 15% is pre-financed by the Cameroonian government. A loan was signed in May 2011 between the Chinese ambassador and the Cameroonian Minister of Economy, Planning and Regional Development for USD 541,566,018 in the form of an export buyer's credit, according to MOFCOM (MOFCOM Cameroon, 2011). Cabestan notes that loan carries a 16-year maturity and a 6-year grace period, with a commercial interest rate of Euribor plus 310 basis points (Cabestan 2015). Our conversations with the Director of Projet Memve'ele were less specific. He noted that the loan has a commercial rate determined by Sinosure, which he estimated to be around "five to six percent". He pointed to a slightly shorter maturity period of 15 years, with a 5-year grace period (Authors' interview, 7 Jan 2016(b)).

5.1.2. Project background

Plans for the Memve'ele project have circulated in Cameroon for over 30 years. The Ntem River was chosen as a site for potential hydropower development as a means of diversifying hydropower production away from the Sanaga basin, where most of the current capacity is situated. The GOC first partnered with the Japanese International Cooperation Agency (JICA) to conduct feasibility studies for the project between 1991 and 1993, and a project steering committee was established under the Ministry of Water and Energy (Nippon Koei 1993). However, due to economic crises, the project was stalled until 2005, when the committee was revived.

A Build-Operate-Transfer (BOT) structure agreement was signed in 2007 with Southern Energy, a subsidiary of British firm Globaleq, which won the initial tender, with construction set to begin in 2009. The project's financing was to be shared by CDC (the parent company of Globaleq), the African Development Bank (AfDB), the Dutch Development Bank, and the Multilateral Investment Guarantee Agency (MIGA) (MOFCOM Cameroon 2008). This arrangement fell through in 2009 after Globaleq pulled out due to "lack of progress on a number of issues" (CDC Group 2009). According to respondents at Projet Memve'ele, this was due to the GOC being unable to fulfill its side of the agreement, namely, the construction of roads to the project and a transmission grid, and the securing of a power purchase agreement (PPA) with the state utility company Sonel (Authors' interview, 7 Jan 2016(b)).

Subsequently, the GOC approached Sinohydro, the second firm to have pre-qualified during the tender process. Sinohydro promised project financing from China Eximbank in return for the contract. As the GOC was unwilling to start another tender process—a condition for financiers such as the AfDB—Sinohydro was selected as contractor. Construction of the transmission lines to Ebolowa, the nearest town, was also contracted to Sinohydro's 16th Bureau, which will connect the power to Cameroon's southern network and to Yaoundé. However, issues surrounding land appropriation and compensation have delayed the project, according to Sinohydro staff, and its completion date is unknown (Authors' interview, 18 Jan 2016). Projet Memve'ele, under the Ministry of Water and Energy, manages the construction of both the dam and transmission lines. A separate entity will be created to manage power production, although the level of progress on that front is unclear.

5.1.3. Environment and social management

The dam's proximity to Campo Ma'an National Park has raised concerns over the effects on wildlife from construction. The dam design is run-of-river, which entails relatively minimal impacts in terms of flooding from the barrage. However, the transmission lines may cut through park territory, and the reservoir and site will submerge part of the park (International Rivers, 2010). Meanwhile the influx of project construction workers also raises risks of poaching near the project site area. The GOC commissioned an environmental and social impact assessment (ESIA) for Eximbank approval in 2010. These, along with an environmental and social management plan (ESMP) and a compensation and resettlement plan (CRP), were conducted in accordance with Cameroonian law, as well as World Bank standards; the documents are not publically accessible (Pöyry, and Alpha Technology, 2010).

Separately from the dam project, the GOC also created the "Programme d'Accompagnement Socio-Economique de Memve'ele" (PASEM), implemented by Projet Memve'ele, which is intended to benefit the socio-economic development of local village populations, as well as compensate them for some of the dam's impacts, and provide them with public services in health, education, and infrastructure (Projet Memve'ele, 2016).

5.2. Lom Pangar hydroelectric project

Lom Pangar project is located in Eastern Cameroon on the Sanaga

Table 1
Project comparison breakdown.

	Memve'ele	Lom Pangar
Project type	Large run-of river hydroelectric dam & generator	Large regulating dam & hydroelectric plant
Hydroelectric Capacity	210 MW	30 MW
Financing bodies	China Eximbank	World Bank, AfDB, ADF, EIB
Project total cost	637 m USD	494 m USD
Loan amount	542 m USD (Eximbank)	132 m (World Bank); 29 m (AfDB); 40 m (EIB); 79 m (ADF)
Loan terms	Euribor + 3.10%, 15 year, 5 year grace period.[a]	0.5%, 40 years, 10 year grace period (World Bank). 2.5%, 25 years, 8 year grace period (AFD) 0.75%, 50 years, 10 year grace period (AfDB) 4.5%, 20 years, 5 year grace period (EIB)
Contractor	Sinohydro 16th Bureau	China International Water and Electric
Contract type	Engineering, procurement and construction (EPC)	Civil works contract
Project Manager	Project Memve'ele	Electricity Development Corporation
First Involvement of Financiers	2009	2005
Loan signing	2011	2012
Construction began	Jan – 2013	Dec – 2012
Project completion (dam only)	Sep – 2017	Dec – 2015

[a] Interview (Yaoundé, Cameroon, Project Memve'ele), 7 Jan 2016. This figure differs slightly from Cabestan (2015), as we note.

river basin. The project involves a regulating dam, a 30 MW power plant and network of transmission lines to neighboring Bertoua as part of a rural electrification project that will connect 2400 nearby households to the grid. The project is financed by a consortium of donors including the World Bank, the AfDB, the Agence Française de Développement (AFD), and the European Investment Bank (EIB). The project's contractor is China Water and Electricity (CWE).

The construction of the regulating dam for Lom Pangar was awarded to CWE as a single-discipline tender, in contrast to the Memve'ele's EPC model.[1] Lom Pangar's project design was contracted separately to a French firm, ISL Engineering. The project management falls under the Electricity Development Corporation (EDC), an entity created under the Ministry of Water and Energy specifically to manage the Lom Pangar project and future potential hydropower projects. Dam construction took place from 2011–2015 and, as of January 2016, the barrage construction was complete. The 30 MW power plant and the transmission lines are still in the construction stage.

5.2.1. Funding

The total cost of the dam is USD 494 million. The financing for different parts of the project is divided between the multilateral donors, with the remainder being financed by the GOC. The World Bank is financing 74% of the dam's cost, with the EIB funding the remaining 24% (see Table 1). The AfDB is separately financing the 30 MW power plant and transmission lines, along with the rural electrification project, while the AFD is financing the social and environmental plans (Authors' interview 6 Jan 2016).

5.2.2. Project history

Discussions for the Lom Pangar project have been ongoing for over 20 years. According to representatives at the World Bank, it was initially proposed as part of a wider plan to increase the hydropower generation capacity of the Sanaga basin by conserving water from the rainy season to release in the dry season. According to existing estimations, Lom Pangar will boost the production capacity of the downstream hydroelectric plants, Edea and Song Loulou, by around 120 MW. The project also makes further hydropower development feasible: the World Bank IFC is financing Nachtigal, another downstream 420 MW hydroelectric dam downstream expected to be commissioned in 2021 (Authors' interview 20 Apr 2016).

During the 1990s, plans for the dam stalled as the World Bank shifted away from high-risk hydropower to private-sector projects and soft infrastructure. One GOC respondent commented that China Eximbank had expressed interest in financing the project around 2006, suggesting that this is what sparked renewed interest on the part of the MDBs (Authors' interview 13 Jan 2016). In 2005, the World Bank reconsidered the project, and discussions with the GOC began again shortly thereafter. CWE was contracted in 2011 through an open competitive tender. The loan was finally approved by the Board of Directors in 2012.

The Lom Pangar project experienced setbacks after the World Bank Group Integrity Vice Presidency reported some potential fraudulent behavior on the part of CWE during its prequalification process. The firm had allegedly used documentation and projects from other Chinese construction companies as its own in support of its bid (World Bank, 2015). As a result, the World Bank debarred CWE from submitting tenders for its contracts for three years (World Bank 2014c). The period of the debarment, and the fact that CWE was granted a conditional release, reflected the fact that it had cooperated with the World Bank's Integrity Vice Presidency. Furthermore, CWE was allowed to continue working on the project, as the fraudulent practices were not perceived to impact its ability to construct the project according to the contract's requirements (Authors' interview 20 Apr 2016).

5.2.3. Social and environmental impacts

The project is located in a sparsely populated area; though Lom Pangar will result in 16 families and 57 houses requiring resettlement from the dam construction and transmission projects (African Development Fund, 2011). However, the nature of the dam and reservoir carries severe environmental impacts, which will result in significant flooding of parts of the Deng Deng National Park and gorilla reserve. The park itself has been expanded to compensate for the areas that will be submerged by the dam, and the project will also finance infrastructure for wildlife protection, such as “eco-guards”. The flooded area will also affect parts of the Chad-Cameroon pipeline, which will operate under water for some parts of the year.

The ecologically sensitive nature of the project has triggered several World Bank safeguard policies relating to forestry and natural habitats, among others. A number of mitigation plans were taken by the project management and financiers as a condition for the loan approval and disbursement, and an independent social and environmental panel was created by the EDC to monitor and advise on the environmental and social aspects of the Lom Pangar project, which are listed in the World Bank project appraisal report. This involved participatory approaches, including socio-economic surveys and seminars, to consult with stakeholders and clarify expectations (ibid).

[1] The company referred to this as a “Build & Manage” model.

6. Comparative analysis

6.1. Financing and contracting

One primary question raised by this study is why and how the GOC made its choice between China Eximbank and the World Bank for project financing. Plans for both had floated around for decades, and both were originally expected to be financed by Western multilateral sources. Unlike the claims of "rogue aid", our findings do not support the claim that Chinese finance is cheaper, or that it undercuts Western financial institutions. In this case, the loan for Memve'ele was offered at a commercial rate much higher than the IDA loan that financed Lom Pangar. Crucially, it was also tied to the contractor, Sinohydro. However, while this project was financed using commercial rates, multiple other Chinese-financed projects in Cameroon were awarded concessional lending, including the Mekin dam as well as the Kribi deep-water port expansion. Because of these multiple other projects concurrently financed by Eximbank, respondents implied, Memve'ele had not qualified in the competitive process for a concessional loan. However, despite higher loan costs, the commercial loan seems to have been a saving grace for the project, without which it would almost certainly have stalled.

Though the construction of both projects was contracted to Chinese firms, the two firms got involved in the projects in fundamentally different ways. CWE came on to the Lom Pangar project in 2011, after the project management and independent evaluators had been hired, through a competitive open tender process (albeit somewhat fraudulently). Meanwhile, the Eximbank commercial loan was conditional on hiring a Chinese contractor (Authors' interview 6 Jan 2016). As was the case with Ghana's Bui Dam, Sinohydro ultimately landed the contract.

A number of respondents commented positively on the speed and efficiency of the Chinese loan, suggesting that Chinese finance in this case was chosen for its efficiency and expediency, rather than for cost considerations. Only two years went by from Sinohydro's first involvement in the project to the loan's signature. As for Lom Pangar, the World Bank reignited the project around 2005, but the loan was only approved in 2012—seven years later. Despite the bureaucratic hurdles entailed by working with the MDBs—each with its own expectations and rules that needed to be juggled—many respondents concluded that the trade-off was ultimately worth it. One interviewee commented that there was "lots of suffering at the start, but then you are happy later" (Authors' interview 14 Jan 2016).

6.2. Environmental and social impacts

The nature of the two projects' effectively determines their respective environmental impacts: as a run-of-river project, Memve'ele does not depend on a large storage dam to generate hydropower; the flooded area is comparatively much smaller and less environmentally impactful. Therefore, in contrast to popular perceptions of Chinese-financed projects in Africa, China Eximbank financed a *less* environmentally risky project than the World Bank.

Both projects experienced similar risks in the construction phase, such as migration, pest and disease spread, the drawbacks of forest clearing for the site preparation, and the impacts for aquatic systems of the dam-filling. Similar to previous studies done of Chinese dams in Ghana and Cambodia, we find that both projects complied fully with the Cameroonian legal requirements for environment and social impact mitigation planning and assessment (Hensengerth, 2011; Kirchherr et al., 2016). Furthermore, both projects employed European consultancy firms to conduct their respective assessments. Both projects also financed anti-poaching efforts, including guards for the national parks, and public health programs in local areas to counter the spread of HIV, along with malaria and other diseases resulting from water-borne pests. The director of Sinohydro 16th Bureau noted that the company had contributed to local schools and hospitals, by donating books and building materials. Meanwhile, CWE donated gravel to local villages, as well as computers and stationery (Authors' interview 14 Jan 2016; Global Exhibition, 2015). These activities demonstrate a greater awareness of norms of corporate social responsibility and "giving back" to local communities on the part of Chinese firms.

However, though both projects ostensibly adhered to national and international standards, the capacity on both sides to manage these impacts and enforce compliance differed considerably. There was also a gap in their respective level of rigor. Because of its extremely sensitive nature, the Lom Pangar project team at the World Bank took over five years to submit the loan for approval, in order to conduct the necessary environmental studies and compensation plans, which was financed as a separate package by the AFD. The comprehensive social and environmental management plan (ESMP) was designed to comply with all World Bank safeguards, as well as national laws and regulations, and would include the expansion of the Deng Deng National Park and financing for conservation management. This suggests notable progress with regards to the consideration given to local populations and the environment by the World Bank since the publication of the WCD report.

Meanwhile, the Eximbank loan approval process for Memve'ele was swifter. Eximbank's environmental policy also requires that an environmental impact assessment be conducted as a condition of loan disbursement. However, in line with China's non-interference norms, Eximbank requires that standards for compliance be based on domestic laws and regulation, and it does not offer feedback or revisions to the to the assessments once approved (China Exim Bank, n.d.).

Both projects are subject to regular inspections from their respective financiers: the World Bank sends inspection teams to Lom Pangar three times per year, and Memve'ele receives inspectors from Eximbank every six months. However Eximbank inspectors perform largely technical functions, and verify that the project's specifications fulfill the contract (Authors' interview 18 Jan 2016). As we find in the case of other Chinese dams across the world, the responsibility for the implementation of the ESMP and CRP lies with the host government, not with Sinohydro or Eximbank (Freeman, 2017; Urban et al., 2015; Hensengerth, 2011). Though both projects address the rights of local inhabitants, compensation schemes differ: in the Memve'ele project, displaced households were compensated for lost houses and crops in accordance with Cameroonian law, while the World Bank's compensation rates for project Lom Pangar were reportedly higher, with a broader scope of compensation that extended to livelihood changes and lost economic activity (Authors' interview 18 Jan 2016). The concerns raised by Scudder (2001) with regards to the funding of resettlement for local populations by the World Bank were not prominent in the case of Lom Pangar.

French firm Coyne et Bellier is tasked with monitoring and evaluating both projects. However, its capacity in the Memve'ele project is limited to the provision of technical assistance to the government, rather than operating as an independent monitor, as it does as part of Lom Pangar. Furthermore, Coyne et Bellier was only brought on to Projet Memve'ele after Sinohydro had begun construction, and was thus unable to monitor compliance in the early phases of the project. A representative at the Ministry of Forestry and Wildlife noted the differences in the funders' attitudes toward monitoring and compliance: while the World Bank would "threaten" them over certain issues, such as deforestation and the protection of gorillas, there was more "flexibility" in the Memve'ele project (Authors' interview 13 Jan 2016). This gap in enforcement illustrates the enduring divergence between the strong conditionality of Western finance and non-intervention in Chinese finance.

One interviewee gave an example of an issue that arose in the resettlement plans for Memve'ele, when a resettlement area turned out to have been already assigned to a private forestry concession. Although this was a problem, he emphasized that Eximbank did not stop the construction, whereas under the World Bank the work would have

certainly been halted (ibid). However, the lightning speed of Memve'ele's construction was not a total boon. According to Coyne et Bellier, though the dam construction itself was ahead of schedule by three months, resettlement plans were lagging far behind, in turn delaying the resettlement and compensation process, and potentially, the project's commission itself (Authors' interview 18 Jan 2016).

6.3. Labor and construction

A common theme in both projects is that, while both Chinese contractors—Sinohydro and CWE—are said to have performed well in the technical aspects of their respective projects, their compliance with social and labor standards was more problematic. Contrary to the widespread idea that Chinese firms import their own labor, both construction sites employed a large number of local workers. Lom Pangar was expected to generate 800 local jobs, while Memve'ele employed around 1500 Cameroonian workers, largely hired from neighboring areas. However, labor tensions and problems of communication were endemic. As in the case of other Chinese dams in Africa—such as the Bui dam in Ghana—both projects in Cameroon experienced issues with labor protests and strikes at construction sites. Workers at Memve'ele protested in June 2015 against poor working conditions, including unfair dismissals, harassment, and assaults (CamerounWeb 2015). This was allegedly broken up by the police the following month, prompting an intervention by the Minister of Labor and Social Security (ITUC 2015). Lom Pangar experienced three labor strikes in 2012 against low pay and poor working conditions, including grievances over discrimination against local workers. In response, the company released a public document in 2014 emphasizing its respect for human rights and clarifying its compliance in areas such as housing standards and workers contracts, which the document notes, "followed the labor laws of Cameroon" (China International Water & Electric Corp, 2014). CWE hired security personnel "to assure the safety of necessary facilities" during the strike. Though these more sensitive issues were not discussed during interviews, the reports do illustrate endemic problems in labor relations between Chinese contractors and local workers not limited to a single country or firm.

A grievance common to both sites is the segregated nature of Chinese and local workers' housing, with higher quality housing for the Chinese staff, though this also reflects differences in work status. Respondents at the World Bank acknowledged that local expectations about housing, though legally valid, were unrealistic in remote settings.[2] However, according to the project staff, current practices were consistent with the World Bank's own standards for labor and housing as part of infrastructure projects of this nature (Authors' interview, 20 Apr 2016). A more serious malpractice that prompted an intervention from the World Bank was over the provision of meals for workers. CWE was contractually mandated to provide meals to the workers, but interpreted this to mean providing them at the workers' own expense. This misunderstanding represented a breach of contract to the World Bank, which was concerned about not only the welfare of workers, but also the spillover effects this could have locally for illegal wildlife poaching. The dispute ended with CWE conceding, but resulted in an inflation in the project's total cost.

In the case of such labor disputes, a crucial difference between the two projects was the ability and willingness of EDC and the World Bank to enforce contractor behavior at Lom Pangar. According to a World Wildlife Fund report, CWE integrated environmental protection measures including improvements to waste collection, transport, and sanitation only after EDC threatened to halt the project following a site visit from the World Bank. A respondent at Coyne and Bellier also confirmed that when the firm filed a complaint against CWE for practices that were "non-standard" according to contract, the World Bank stepped in and halted disbursement until CWE improved. In contrast, when Coyne and Bellier tried to file "non-standards" with the project manager at Memve'ele, there was no follow through to Eximbank, and its recommendations for the disbursements to be stopped were not applied (Authors' interview, 18 Jan 2016).

6.4. Technology transfer

For both projects, external finance enabled a transfer of hardware and construction of facilities that would have otherwise not been feasible. The World Bank-financed Lom Pangar and Eximbank-financed Memve'ele projects comprised key differences in design and technical standards. Chinese firm CWE constructed Lom Pangar according to design specifications by the French firm ISL. Meanwhile, Memve'ele was both designed and constructed by a single Chinese firm, Sinohydro, according to Chinese standards. It is beyond the scope of this research to assess whether differences in technical standards have impacts for the projects' effectiveness. However, ensuring mutual compatibility between Chinese design standards and the standards of the French firm Coyne et Bellier tasked with monitoring construction was a source of difficulty in Memve'ele's case (Zhao 2017).[3] In the Memve'ele project, machinery and construction equipment, as well as other inputs such as raw steel and concrete were all imported from China, due in part to their cheaper cost and higher quality; but, as emphasized in the technology transfer literature on FDI, it also means fewer opportunities to create value chains with the domestic economy.

Though the spillovers from supply chain linkages were limited, both projects did entail soft technology transfers. Lom Pangar reportedly had a number of local engineers trained in China for two years (Ndukong 2017). As part of Memve'ele's economic program, 300 young people were provided with a 45-day construction training program in such fields as welding, carpentry, and electrical engineering (China Society for Hydropower Engineering 2014). However, interviews and field visits with the Chinese contractors revealed that the vast majority of construction workers appear to be trained informally on-site. Furthermore, a visible divide exists between local workers and the Chinese expatriates, who occupy higher engineering and supervisory roles. That said, some higher-level staff we spoke to were Cameroonian who had earned degrees or qualifications in China. Indeed, Sinohydro sent 10 Cameroonian engineers for training in China, with the aim that they would in turn train other local engineers at Projet Memve'ele (Authors' interview 8 Jan 2016; camerountribune 2017). Though this constitutes a small fraction of the total workers employed, it does demonstrate initiative on the part of Chinese firms to deliberately engage in skills and expertise transfers to local populations.

6.5. Institutional relations

The two projects' respective financiers had distinct impacts in terms of their transfer of management practices. The differing level of involvement of the financiers, and the nature of the projects' contracts, entailed more institutional capacity building for the World Bank-financed Lom Pangar, compared to Chinese-financed Memve'ele. Projet Memve'ele was established to oversee the design and construction of the dam, under the direct purview of the Ministry of Water and Energy. Meanwhile EDC, which manages Lom Pangar under the same Ministry, was created as an autonomous body, with the objective of managing all future hydropower developments in the country. The funding from the World Bank and the AFD also covered the training of specialists on

[2] For example, workers are legally entitled to one day mandatory holiday per week and a single room for each worker. In practice, this was unfeasible. Instead, Lom Pangar workers were given four days off per month, and lived in shared accommodation with four to a room.

[3] Some of this came down to problems of translation between Chinese design specifications, and differences between Chinese and French technical specifications and construction methods.

environmental safeguards, engineering, and monitoring and evaluation, thereby ensuring long-term institutional capacity-building and the dissemination of World Bank norms and standards (World Bank 2012). Meanwhile, from the perspective of the government, despite the time it took for Lom Pangar to be approved, and the relatively slow process of working with multiple donors, representatives of the GOC saw the World Bank in a very positive light after the successful implementation of Lom Pangar.

One consequence of the close relationship between the World Bank and specific agencies has been the creation of bureaucratic competition within the government. The World Bank has been pushing for a greater role for EDC in managing future hydropower projects, including the forthcoming IFC-financed 420 MW Nachtigal hydroelectric dam downstream. Representatives at the World Bank voiced support for EDC to be the main institutional player in future hydropower projects, given its technical expertise and capacity in managing environmental and social management issues for such projects. However, other ministries are competing for influence: the Ministry of Water and Energy also seeks to manage of the Sanaga river basin, since the agency that controls the basin's institutional arrangements will also control their substantial revenue flows.

Projet Memve'ele, meanwhile, did not integrate knowledge transfer through this type of institutional capacity building. While the need to facilitate the construction and management of future downstream IFC-financed projects generated clear incentives for the World Bank to build up management capacity through EDC, there are no similar structural incentives for China Eximbank with Memve'ele, as a standalone turnkey project.

Lom Pangar has been justified as a public good project, generating beneficial spillovers to downstream hydropower generation. As such, it was financed concessionally, whereas downstream Nachtigal will be financed with the IFC through a commercially oriented public-private partnership. Meanwhile, some have expressed skepticism regarding the political economy of Memve'ele and its economic value. While a technically sound project, opinions differ over whether it represents a "white elephant". One interviewee at the World Bank contended that it was ultimately a political project: though it provides a necessary stopgap until Nachtigal is operational, the project reportedly still does not have a power purchase agreement with the national state utility, calling into question its economic viability (Authors' interview 2016). Delays over resettlement and land compensation issues over the transmission project also raise questions as to when the project will start generating revenues and enter its loan repayment phase—demonstrating that the concerns raised by the WCD are still ongoing. This raises further questions over Eximbank's rationale in financing the loan: while it guaranteed a contract for Sinohydro and the fueled the "going out" of Chinese SOEs in Cameroon, there has been little sign of pressure from Eximbank to secure returns for a debt it will eventually be owed.

7. Conclusions

Africa's underdeveloped hydropower potential has made it an attractive destination for Chinese and Western development finance, both of which can make valuable contributions to energy security and infrastructure. Our comparative case study finds that, despite the negative perceptions of Chinese hydropower infrastructure in Africa, the reality on the ground is more nuanced. In Cameroon, China's development finance complemented that of multilateral development banks, as the GOC was able to access alternative financing from Southern sources to finance projects that Northern lenders would not.

As is the case with other projects in Africa, with respect to environment and social standards, we find that the Chinese-financed project followed Cameroon's legal requirements and Eximbank's own policies. However, in managing foreseen and unforeseen social and environmental impacts, the response and degree of responsibility taken by the financiers differed. Both projects struggled with compliance problems with their respective contractors, as well as labor issues. However, the autonomous managers of the World Bank project enjoyed far better capacity and enforcement mechanisms, and a greater willingness to use them to ensure compliance.

For Chinese firms, such overseas contracts are an important means of entering new markets; for the Chinese state, it is a means of promoting Chinese technologies and Chinese goods and services. As such, a consequence of such export credit financing is that it limits potential channels of technology transfers through backward linkages (where local supply chains might benefit from positive spillover effects). Visits to Chinese contractors at the project sites showed that skills transfer to the majority of local employees were informal and limited. That said, for a small minority of staff, Chinese firms have also initiated technical training programs that may entail more institutionalized transfer of technical expertise, which will be crucial to the long-term sustainability of these projects.

A key difference in the approach between Northern and Southern donors lies in their institutional relations, and their engagement in institutional capacity building. In the case of Lom Pangar, the World Bank helped create institutional capacity under the Ministry of Energy and Water, and cultivated close ties in order to ensure quality managerial capacity and political buy-in for future projects downstream. The Northern donors' approach to technology transfer had a greater impact on institutional and regulatory capacity while that of China Eximbank overwhelmingly focused on technical skills and engineering. Both modes of technology transfer will be essential both for the long-term efficiency of hydropower projects and ensuring their contribution to sustainable development.

Both China Eximbank and the World Bank have upped their game in prioritizing environmental norms and standards. However, we find that the strictness with which they are applied differ. The World Bank, while aggressively re-entering the hydropower sector, has prioritized its safeguard policies and demonstrated the political will to enforce them. In the case of Lom Pangar, it even stepped in to support the EDC in managing breaches of contract. On the other hand, in the case of Memve'ele, China Eximbank played a silent role in the project implementation. While impact assessments and mitigation plans were a condition for loan disbursement, their monitoring and enforcement were largely the responsibility of the GOC, for better or worse, thereby exposing a gap between theory and practice. There is a trade-off, as some government respondents intimated, between Chinese and Western financing: while financing from China is disbursed faster, it poses a higher risk of issues arising during the implementation stage. Conversely, Northern finance featured a tougher approval process, but the construction process was a smoother one.

Both Chinese contractors CWE and Sinohydro struggled with meeting international standards with respect to labor and environmental issues. However, both acknowledged the need to comply with them, and the importance of CSR activities overseas. The willingness of both firms to discuss these issues demonstrates a recognition of the growing importance of international norms and practices, and a desire to be seen as engaging with them. However, this comparative case study also illustrates how firms with different financiers can be subject to different levels of pressure to do so. Though rising Southern actors play an important role in global infrastructure finance that complements Northern donors, re-emerging Northern donors and multilaterals may also have an important role in setting the norms and standards for the management and implementation of such projects, and ensure their potential to contribute to inclusive growth and sustainable modes of development.

8. Policy recommendations

Our conclusions from this case study yield the following recommendations:

8.1. China Eximbank

While Chinese financiers conform to host countries' legal frameworks, they should institutionalize and—where they exist—enforce their own rules about environmental impact mitigation, labor relations and training, community relations, and corporate social responsibility. This requires political will, but also capacity building on the part of China's policy banks, and of the state bodies under MOFCOM involved in monitoring and enforcing compliance in overseas projects. This would serve to enhance the outcomes of Chinese financed projects and their long-term sustainability, while simultaneously raising China's reputation as a provider of development finance. As China's overseas infrastructure ambitions grow—such as the Belt and Road initiative—its capacity to anticipate and manage the local impact of its projects, and their reputational consequences, will be crucial.

8.2. Chinese contractors

Chinese contractors are increasingly cognizant of the benefits and necessity of CSR and community engagement, but issues of language, labor and work expectations represent endemic problems and potential obstacles to successful project completion, as well as their competitiveness and reputation. However, firms must not only address the technical task of delivering projects on time and to cost—they must also take greater responsibility in managing and mitigating the social impacts of their work. Chinese firms should look for opportunities to partner with local civil society organizations to address community grievances. Beyond abiding with national laws, they should align with international best practices regarding environmental and social impact mitigation, ensuring they maintain credible standards that may be higher than those of the institutional contexts in which they operate.

8.3. The World Bank

While the World Bank already possesses robust frameworks to address environmental and social issues, and institutional relations, its difficulties in enforcing compliance with CWE suggests it should provide more technical assistance to its contractors on how to respect its norms and rules, and support them in their own training and skills transfer initiatives. This is particularly salient as an increasing share of World Bank tenders are being won by firms from emerging countries, where standard practices vary significantly. Proactively implementing such measures would not only reduce costs and delays during the implementation stages of projects, but it may also contribute to processes of norm diffusion in the home countries of the contracting firms, thereby encouraging the adoption of higher standards in project finance across the world.

8.4. Host governments

Governments in Africa and throughout the global south should leverage the opportunities for infrastructure finance that new Southern partners such as China can offer. However, host governments must strengthen their regulatory frameworks and their capacity to hold contractors to account in order to ensure compliance with social and environmental standards, as well as local labor laws. Governments should also be strategic when leveraging external finance, in order to maximize technology transfers. Beyond the benefits of construction, governments have a responsibility in ensuring the long-term benefits of new infrastructure. This should be done, first, through adequate due diligence processes, approving only economically sustainable projects that can be delivered on time. Second, raising local content requirements may encourage foreign partnerships with local enterprises that utilize local content more effectively. Finally, governments should encourage greater soft technology transfers by institutionalizing skills training and knowledge transfer from foreign actors to the domestic economy, thus ensuring that the benefits to local workers and communities last beyond the period of the project's construction.

References

African Development Fund, 2011. Lom Pangar, Republic of Cameroon. Project Appraisal Report. Project Appraisal Report. African Development Fund, November 10, 2011.

Bosshard, Peter, 2008. China's Environmental Footprint in Africa. SAIS Working Papers in African Studies, 01-08. Washington: Johns Hopkins University School of Advanced International Studies. 〈http://198.61.250.55/sites/default/files/China%27s-Environmental-Footprint-in-Africa.pdf〉.

Briscoe, John, 2010. Overreach and response: the politics of the WCD and its aftermath. Water Altern. 3 (2), 399.

Cabestan, Jean-Pierre, 2015. China–cameroon relations: fortunes and limits of an old political complicity. S. Afr. J. Int. Aff. 22 (1), 67–91. http://dx.doi.org/10.1080/10220461.2015.1014930.

CamerounWeb{C}, 2015. Memve'ele Dam Site: Workers Protest, June 6, 2015. 〈http://www.cameroonweb.com/CameroonHomePage/NewsArchive/Memve-ele-Dam-Site-Workers-protest-327091?lang=〉.

CDC Group, 2009. Memorandum Submitted by the CDC. UK Parliament, April 6, 2009{C}. 〈http://www.publications.parliament.uk/pa/cm200809/cmselect/cmenvaud/30/30we14.htm〉.

Chin, Gregory T., 2016. Asian infrastructure investment bank: governance innovation and prospects. Glob. Gov.: Rev. Multilater. Int. Org. 22 (1), 11–25.

{C}China Exim Bank. Export-Import Bank of China Environmental Policy 关于中国的环境保护政策," n.d.

{C}China International Water & Electric Corp, 2014. Clarification concerning execution of Lom Pangar Dam construction contract in observation report on respect of human rights on sites of major projects in Cameroon: Lom Pangar, Mballam, Nkamuna and Mobilong. March 2014. 〈https://business-humanrights.org/sites/default/files/media/documents/company_responses/cwe-response-re-cameroon-lom-pangar-dam-03-mar-2014-en.pdf〉.

China Society for Hydropower Engineering, 2014. Cameroon is training 300 youth in the implementation of memve'ele hydropwer station '喀麦隆为实施曼维莱水电站培训300名青年–中国水力发电工程学会.'. CSHE: China Soc. Hydropower Eng July 24. 〈http://www.hydropower.org.cn/showNewsDetail.asp?nsId=13767〉.

China Overseas Dams List International Rivers. Accessed November 15, 2017. https://www.internationalrivers.org/resources/china-overseas-dams-list-3611.

Clark,, Dana, Jonathan, Fox, Treakle, Kay (Eds.), 2003. Demanding Accountability: Civil Society Claims and the World Bank Inspection Panel. Lanham, Md: Rowman & Littlefield Publishing.

Dreher, Axel, Fuchs., Andreas, 2015. Rogue aid? An empirical analysis of China's aid allocation. Can. J. Econ./Revue Canadienne D'économique 48 (3), 988–1023. (August). 〈https://doi.org/10.1111/caje.12166〉.

Eyben, Rosalind, Savage, Laura, 2013. Emerging and submerging powers: imagined geographies in the new development partnership at the busan fourth high level forum. J. Dev. Stud. 49 (4), 457–469. (April). 〈https://doi.org/10.1080/00220388.2012.733372〉.

Freeman, Carla P., 2017. Dam diplomacy? China's new neighbourhood policy and chinese dam-building companies. Water Int. 42 (2), 187–206. 〈https://doi.org/10.1080/02508060.2017.1276040〉.

Global Exhibition, 2015. Chinese Companies to Build the Largest Dam in Cameroon to Ease the Tension in the Power Supply. Global Exhibition, September 23, 2015. 〈http://www.globalexh.com/article/show/2581.aspx〉.

Gouvernement du Cameroun. Note de Conjoncture n°15 Dette Publique. September 2015.

Hensengerth, Oliver, 2011. Interaction of Chinese Institutions with Host Governments in Dam Construction: The Bui Dam in Ghana. Discussion Paper / Deutsches Institut Für Entwicklungspolitik, 3. Dt. Inst. für Entwicklungspolitik Bonn.

Hwang, Jyhjong, Deborah, Brautigam, Nancy, Wang, 2015. Chinese Engagement in Hydropower Infrastrcture in Sub-Saharan Africa. Working Paper. SAIS-CARI Working Paper Series. Johns Hopkins SAIS: China Africa Research Initiative. December 2015.

International Rivers, 2010. African Dams Briefing 2010. June 2010{C}. 〈https://www.internationalrivers.org/files/attached-files/afrdamsbriefingjune2010.pdf〉.

International River. Guidelines for Environmental and Social Impact Assessments of the China Export and Import Bank's Loan Projects. International Rivers, n.d. 〈https://www.internationalrivers.org/resources/guidelines-for-environmental-and-social-impact-assessments-of-the-china-export-and-import〉.

{C}ITUC. ITUC Global Rights Index. ITUC Survey of violations of trade union rights, July 31, 2015. 〈http://survey.ituc-csi.org/?lang=en〉.

King, Kenneth, 2013. China's Aid & Soft Power in Africa: The Case of Education & Training. Currey, Woodbridge (African Issues).

Kirchherr, Julian, Disselhoff, Tim, Charles, Katrina, 2016. Safeguards, financing, and employment in chinese infrastructure projects in Africa: the case of Ghana's Bui Dam. Waterlines 35 (1), 37–58.

Liu, Zhiqiang, 2008. Foreign direct investment and technology spillovers: theory and evidence. J. Dev. Econ. 85 (1–2), 176–193. http://dx.doi.org/10.1016/j.jdeveco.2006.07.001.

Mawdsley, Emma, 2017. Development geography 1: cooperation, competition and convergence between 'North' and 'South'. Prog. Hum. Geogr. 41 (1), 108–117. http://dx.doi.org/10.1177/0309132515601776.

McDonald, Kristen, Bosshard, Peter, Brewer, Nicole, 2009. Exporting Dams: China's Hydropower Industry Goes Global. J. Environ. Manag. 90, S294–302. https://doi.org/10.1016/j.jenvman.2008.07.023.

{C}MOFCOM Cameroon{C}, 2008. Cameroon Memve'ele Hydropower Station Project -

People's Republic of China Embassy of the Republic of Cameroon at the Economic and Commercial Counsellor. June 19, 2008. 〈http://cm.mofcom.gov.cn/aarticle/ztdy/200806/20080605610367.html〉.
MOFCOM Cameroon, 2011{C}. Cameroon Signed the Loan Agreement Memve'ele Hydroelectric Project - People's Republic of China Embassy of the Republic of Cameroon at the Economic and Commercial Counsellor. Economic and Commercial Counsellor's Office of the Embassy of the People's Republic of China in the Republic of Cameroon. May 4, 2011. 〈http://cm.mofcom.gov.cn/article/todayheader/201105/20110507530570.shtml〉.
Mohan, Giles, 2013. Beyond the enclave: towards a critical political economy of China and Africa: towards a critical political economy of China and Africa. Dev. Change 44 (6), 1255–1272. http://dx.doi.org/10.1111/dech.12061.
Moore, Deborah, John, Dore, Gyawali, Dipak, 2010. The world commission on dams+10: revisiting the large dam controversy. Water Alternatives 3 (2), 3.
Naím, M., 2009. Rogue Aid. Foreign Policy 159, 95–96.
Kimeng Hilton, Ndukong, 2017. Chinese Company Completes Construction of Cameroon's Lom Pangar Dam - People's Daily Online. People's Daily, July 11, 2017, Online edition. 〈http://en.people.cn/n3/2017/0711/c90000-9240131.html〉.
Nippon, Koei, 1933. Feasibility Study on Memve'ele Hydroelectric Development Project. Japan International Cooperation Agency, October 1993.
Pöyry, Alpha, Technology, 2010. Projet Hydroélectrique de Memve'ele: Etude d'Impact Environnemental et Social Rapport Final EIES. September 14, 2010.
Projet, Memve'ele. Le PASEM, {C}Un Levier Pour Booster Un Développement Durable de Campo et Ma'an (Accessed 2 May 2016). 〈http://www.projetmemveele.org/node/7〉.
Scudder, Thayer, 2001. The world commission on dams and the need for a new development paradigm. Int. J. Water Resour. Dev. 17 (3), 329–341. http://dx.doi.org/10.1080/07900620120065110.
Urban, Frauke, Nordensvard, Johan, Siciliano, Giuseppina, Li, Bingqin, 2015. Chinese overseas hydropower dams and social sustainability: the Bui Dam in Ghana and the Kamchay Dam in Cambodia: chinese overseas hydropower dams. Asia Pac. Policy Stud, 2 (3), 573–589. http://dx.doi.org/10.1002/app5.103.
Wahab, Sazali, Abdul, Raduan Che, Rose, Osman, Suzana Idayu Wati, 2011. Defining the concepts of technology and technology transfer: a literature analysis. Int. Bus. Res. 5 (1). http://dx.doi.org/10.5539/ibr.v5n1p61.
Watson, Jim, Byrne, Rob, Ockwell, David, Stua, Michele, 2015. Lessons from China: building technological capabilities for low carbon technology transfer and development. Clim. Change 131 (3), 387–399. http://dx.doi.org/10.1007/s10584-014-1124-1.
Winkler, Deborah, 2013. Potential and Actual FDI Spillovers in Global Value Chains: The Role of Foreign Investor Characteristics, Absorptive Capacity and Transmission Channels. World Bank Policy Research Working Paper, no. 6424. 〈http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2256299〉.
World Bank, 2009. Directions in Hydropower. World Bank.
World Bank{C}, 2012. Project Appraisal Document on a Proposed Credit in the Amount of SDR 85.2 Million (US$ 132 Million Equivalent) to the Republic of Cameroon for a Lom Pangar Hydropower Project. International Development Association. {C}March 1, 2012.
{C}World Bank, 2013. Towards a Sustainable Future for All: Directions for the World Bank Group's Energy Sector. World Bank Group. 〈http://www.worldbank.org/content/dam/Worldbank/document/SDN/energy-2013-0281-2.pdf〉.
World Bank, 2016. World Bank Board Approves New Environmental and Social Framework. Text/HTML. August 4, 2016. World Bank. 〈http://www.worldbank.org/en/news/press-release/2016/08/04/world-bank-board-approves-new-environmental-and-social-framework〉.
World Bank, 2014a. Cameroon's Lom Pangar Project Set to Harness Hydropower Potential of the Sanaga River and Boost Electricity Generation. Text/HTML July 23, 2014. World Bank. 〈http://www.worldbank.org/en/news/feature/2014/07/23/cameroons-lom-pangar-project-set-to-harness-hydropower-potential-of-the-sanaga-river-and-boost-electricity-generation〉.
World Bank, 2014b. World Bank Group Commitments Rise Sharply in FY14 Amid Organizational Change. Text/HTML. July 1, 2014. World Bank. 〈http://www.worldbank.org/en/news/press-release/2014/07/01/world-bank-group-commitments-rise-sharply-in-fy14-amid-organizational-change〉.
World Bank, 2014. World Bank Sanctions China International Water and Electric Corp. for Misconduct in Africa and South East Asia. September 24, 2014c. 〈http://www.worldbank.org/en/news/press-release/2014/09/24/world-bank-sanctions-china-international-water-electric-corp-misconduct-africa-south-east-asia〉.
World Bank, Integrity, 2015. Republic of Cameroon: Lom Panga Hydropower Project. Redacted Report, September 2015. 〈http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/10/01/090224b083119481/1_0/Rendered/PDF/Cameroon000Lom0ct000redacted0report.pdf〉.
World Bank, 2017. "The World Bank Social and Environmental Framework." Washington, D.C. http://documents.worldbank.org/curated/en/383011492423734099/pdf/114278-WP-REVISED-PUBLIC-Environmental-and-Social-Framework-Dec18-2017.pdf.
World Commission on Dams, 2000. Dams and Development: A New Framework for Decision-Making. Earthscan, London.
Zhang, Yanbing, Gu, Jing, Chen, Yunnan. "China's Engagement in International Development Cooperation: The State of the Debate." IDS, 2015. Naim, Moises. "Rogue Aid." Foreign Policy, October 15, 2009. https://foreignpolicy.com/2009/10/15/rogue-aid/.
Zhao{C}, Yining, 2017. China Power Construction Group Cameroon Memve'ele Hydropower Project Manager Chen Gao: 'access to Electricity Is Cameroon's Most Important Concern' (中国电建集团喀麦隆曼维莱水电站工程项目经理陈高： '获取电力是喀麦隆最重大的关切'). 21 Jingji, March 29, {C}2017{C}. 〈http://www.21jingji.com/2017/3-29/0OMDEzNjFfMTQwNTY0OQ.html?ulu-rcmd=0_09COM_art_4_4b20651d5db142b19ce2178a2d8e6500〉.