



## Original Article

# Chinese Overseas Hydropower Dams and Social Sustainability: The Bui Dam in Ghana and the Kamchay Dam in Cambodia

Frauke Urban, Johan Nordensvard, Giuseppina Siciliano and Bingqin Li\*

### Abstract

*There is a shortage of empirical studies on the relationship between Chinese hydropower dams and social sustainability. Comparative research on Chinese-funded and Chinese-built hydropower projects is rare. This article aims to fill parts of this gap by discussing these issues in relation to Chinese overseas hydropower dams in Ghana (Bui Dam) and Cambodia (Kamchay Dam). Both projects are built by Sinohydro and financed by ExIm Bank. This article draws on in-depths interviews and focus group discussions with local communities affected by the dams, institutional actors in Ghana and Cambodia, Chinese actors, and dam builders. The article uses an environmental justice perspective as an analytical framework. The article concludes that the dam projects could improve their social sustainability framework in practice and theory; social benchmarking should be*

*introduced and social policies need to be improved to be in line with international social standards on hydropower projects.*

**Key words:** social sustainability, hydropower, China, Ghana, Cambodia

### 1. Introduction

Hydropower dams are experiencing a new renaissance in many parts of the world, particularly in low and middle income countries, where most of the hydropower potential remains at relatively low levels of exploitation. These countries have weak formal social policy to remedy some of the social implications of large infrastructure projects. Often these countries are therefore dependent that hydropower projects include social sustainability to mitigate some of the worst social implications. The social implications of hydropower dams often include resettlement of affected individuals and communities, psychological stress, loss or declines of livelihood, changes to lifestyles and traditions, impacts on fishing and agricultural activities as well as food security, impacts on access to and quality of water and land, as well as a range of environmental adverse effects (Urban et al. 2013). Large dams have been controversially debated for several decades due to their large-scale and often irreversible social and environmental impacts (World Commission on Dams (WCD) 2000).

The controversial nature of hydropower projects forced the World Bank to introduce

\* Urban and Siciliano: Centre for Development, Environment and Policy (CeDEP), School of Oriental and African Studies (SOAS), University of London, 36 Gordon Square, London WC1H 0PD, United Kingdom; Nordensvard: Sociology, Social Policy and Criminology, University of Southampton, Highfield, Southampton SO17 1BJ, United Kingdom; Li: Crawford School of Public Policy, College of Asia and the Pacific, The Australian National University, Canberra, Australian Capital Territory 0200, Australia. Corresponding author: Nordensvard, email <j.o.nordensvard@soton.ac.uk>.

safeguard policies in the 1980s to protect local populations from the consequences of dams. Examples of safeguard policies are involved with issues such as 'environmental assessment, natural habitats, pest management, compensation for involuntary resettlement, indigenous peoples, forests, safety of dams, cultural property, projects in international waterways and projects in disputed areas' (Hall 2007, p. 170). Project such as the Sardar Sarovar Dam Projects in India, the Chonoy dam in Guatemala and the Itaparica hydropower scheme became pivotal to the changes of the World Bank's approach to hydropower (Hall 2007).

At the forefront of the renaissance of hydropower today is not the World Bank but Chinese developers, first and foremost the world's largest overseas dam builder Sinohydro. 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. This is only being rivalled to a similar extent by the China Three Gorges Corporation. 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). Despite the rise of Chinese overseas hydropower dam projects, the development and application of social standards for hydropower dam projects have been slow.

Nordensvard et al. (2015) found that Sinohydro's attempts to improve their social records have resulted in rather vague policy recommendations and a lack of enforceable social standards. In 2011 Sinohydro released its policy commitments entitled 'Policy Framework for Sustainable Development' (Sinohydro 2011; Decarboni.se 2014), which was very closely linked to World Bank Standards. Eight policy commitments from overall 12 policy commitments were matching with World Bank-related performance standards.

Later these documents by Sinohydro were superseded with much weaker and vaguer policies like the Occupational Health, Safety and Environmental Policy (Sinohydro 2013), Statement of Ethical Principle (Sinohydro 2014a), and Sustainable Development Policy (Sinohydro 2014b). These policy documents focus far less on the social implications of the local stakeholders. As China has become the largest investor and builder of hydropower dams, it is of importance to do more comparative research on the practical implications of corporate social responsibility of Chinese hydropower dam projects.

This article aims to analyse social sustainability in two case studies of Chinese hydropower dams in Ghana (Bui Dam) and Cambodia (Kamchay Dam), which are both built by Sinohydro. The case studies are based on in-depths interviews and focus group discussions with local communities, institutional actors in Ghana and Cambodia, Chinese actors, and dam builders. The article uses a social sustainability/environmental justice lens to look at both the substantive and procedural dimension of the social impacts of hydropower dams. The article concludes that the Sinohydro dam projects could improve their social sustainability framework in practice and theory; social benchmarking should be introduced and social policies need to be improved to be in line with international social standards on hydropower projects.

## 2. Theoretical Framework

The main research question of this article is: how do Chinese hydropower projects built by Sinohydro and financed by ExIm Bank ensure social sustainability towards the local affected population? This is being examined by analysing the social sustainability of two Chinese hydropower dams, one in Ghana (Bui Dam) and one in Cambodia (Kamchay Dam). This section discusses the theoretical framework on which the article is based. Key theories are social sustainability, sustainable development and environmental justice.

*Social sustainability* has become an increasingly important part of hydropower dam proj-

ects as they are increasingly built in countries that struggle to cope with the social implications of these large projects. *Sustainability* was popularised by the Brundtland Report in 1987 and became synonymous with 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development 1987, p. 43). There was an interest of integrating the social, economic and environmental dimensions of development. These dimensions were seen as the core pillars of sustainable development. The original Brundtland Report signalled an interest in social issues. It was important to incorporate needs, and the report stipulated that 'the essential needs of the world's poor' should be given an 'overriding priority' (World Commission on Environment and Development 1987, p. 43). The peak of sustainability was in the 1990s, sparked by the United Nations Conference on Sustainable Development in Rio de Janeiro. Twenty years later, the Rio+20 summit put sustainable development back onto the agenda. This will be followed by the sustainable development goals (SDGs), which will build upon the Millennium Development Goals and be in line with the post-2015 international development agenda. While environmental and economic development will be at the forefront of many of the goals, social goals are also firmly embedded in the SDGs.

There has been an attempt to link social sustainability to the concept of *environmental justice*. This makes sense as environmental justice has a more developed social justice perspective compared with the original environmental pillar in sustainable development. This article suggests that such a discourse helps strengthen social sustainability and gives body to an analysis of hydropower dam projects in low and middle income countries. Environmental justice differs from other environmental discourses by defining the environment as the set of linked places 'where we live, work and play' (Turner & Wu 2002, p. 4).

The environmental justice framework originated from a US context that focused around

issues of race and ethnicity and how these were intertwined with the distributions of environmental 'bads', such as pollution and technological risk (Bullard 1999). Environmental justice became the concept for describing political activism in the United States to 'resist the imposition of toxic and polluting facilities in minority and poor communities' (Walker 2009, p. 356). Distributive justice became a focal point in framing how communities of colour have been exposed to environmental hazards, such as toxic waste or other environmental issues. Categories such as gender, race and class and impact of environmental 'bads' and access to environmental 'goods' such as quality of life, natural resources and a clean environment became the heart of discussing distributive justice and the environment (Boström 2012, p. 5).

The focus on distribution has often been expanded upon with other dimensions, such as participation, recognition and capabilities. Pulido (1996), Faber (2005) and Schlosberg (2007) have highlighted the importance of process and production in environmental justice. There is an overarching perception that most pollution and degradation are caused by the more affluent and powerful, and the environmental consequences hit the poor disproportionately. It is therefore important that the decision-making process in environmental policy and particular projects are transparent, just and participative. The importance lies in creating fair processes for environmental policy-making and policy implementation. There is a perception that if the policy-making and implementation have been fair, participating parties tend to accept a disliked outcome (Deutsch 2000). *Procedural justice* is less about equal distribution and more about the direct empowerment and participation of different stakeholders in environmental processes (Boström 2012, p. 5).

Schlosberg discusses the links between political participation and recognition, drawing upon the discussion by both Young and Fraser. The overall argument is that one needs to acknowledge that a lack of respect and recognition could lead to a 'decline in a person's membership and participation in the

greater community, including the political and institutional order' (Schlosberg 2004, p. 519). Schlosberg also argues that we also need to add a capability dimension to environmental justice that 'enrich conceptions of environmental and climate justice by bringing recognition to the functioning of these systems, in addition to those who live within and depend on them' (Schlosberg 2013, p. 44). This approach has created an attempt to include environmental concerns into a movement that has often been perceived to be anthropocentric (Shrader-Frechette 2002). 'When we interrupt, corrupt, or defile the potential functioning of ecological support systems, we do an injustice not only to human beings, but also to all of those non-humans that depend on the integrity of the system for their own functioning' (Schlosberg 2013, p. 44).

Over the decades, environmental justice has expanded both in theory and in geographical application. The interplay between global and local manifestations and agendas has become more important (Walker & Bulkeley 2006; Schlosberg 2007; Carruthers 2008; Schroeder et al. 2008; Sze & London 2008). Sze and London suggest that the environmental justice framework is today used at a global scale, incorporating both global and local concerns on an interdisciplinary basis (Sze & London 2008). Walker (2009) sees this development as a horizontal diffusion of environmental justice ideas, topical and geographic scope.

Agyeman and Evans (2004) argue that 'just sustainability' needs a clear linkage between sustainable development and environmental justice to prevent that the social pillar becomes one-sided. Harvey points out that environmental injustices need to be a first priority on the sustainability agenda (Harvey 1996, p. 385). The links between environmental justice and social sustainability have become more important to enrich the classical understanding of impact assessments and conflicts in the light of large infrastructural projects, such as hydro-power dams. The importance of these concepts in looking at social impacts tends to focus on 'distributive (fair allocation of resources) and especially procedural justice (recogni-

tion, participation and power distribution)' (Karjalainen & Järviskoski 2010).

### 2.1 Analytical Framework

In this study we focus on looking at distributive and procedural dimensions as a way to understand how socially sustainable a hydro-power dam project is (see Table 1). We work with Boström's (2012) conceptualisation of social sustainability. His 'what' category covers *substantive aspects* of social sustainability, hence covering the distributive dimension. His 'how' category covers *procedural aspects* of social sustainability. This article examines how substantive the social sustainability of Chinese overseas dams is. The research thereby questions if the large dam projects can sustain stakeholders' basic needs, support local stakeholders' livelihoods and also provide them with basic services. This looks at the redistributive aspect of corporate

**Table 1 Adapted Social Sustainability Framework for Hydropower Dams, Derived and Amended from Boström (2012)**

<i>Substantive social sustainability for hydropower dams</i>	
Basic needs such as sufficient food, adequate housing, income and extended needs	
Employment and opportunities for learning and self-development	
Provision of basic services such as clean water supply, sanitation, reliable electricity supply, schooling/education, health services, mobility/transportation	
Fair distribution of environmental 'bads' and 'goods'/equality of rights, including human rights, land user and tenure rights, and Indigenous people's rights	
<i>Procedural social sustainability for hydropower dams</i>	
Accountable governance and management of the policy, planning, and standard-setting process and its implementation; including holding actors accountable for fulfilling their promises and pledges	
Social monitoring of the policy, planning, standard-setting process and its implementation	
Access to participation and decision-making in different stages of the process and over time/proactive stakeholder communication and consultation throughout the process	

citizenship. The second aspect that we look at is the procedural aspect to analyse how accountable the processes are, and whether transparent information, communication and participation is happening. In this article we will look at the substantive and procedural dimensions of Chinese hydropower dams in Ghana and Cambodia (see the case study selection criteria in Section 3 below). With substantive dimensions, we have adapted Boström's (2012) categories for analysing social impacts on the local population directly affected by the dams. Substantive dimension here means researching how the affected people have been able to meet basic needs and have access to basic service, and to analyse if their burden is just and fair.

The first part of the empirical section therefore compares the substantive dimension of the Bui Dam in Ghana and the Kamchay Dam in Cambodia. The focus is on people who either experienced losses/declines to their livelihoods and/or had to relocate to new areas to live. The overall research question is how do Chinese hydropower projects built by SinoHydro and financed by ExIm Bank ensure social sustainability towards the local affected population? The subquestion for this part is: how do hydropower dam projects impact the social welfare of the affected population, and which policies have been in place to mitigate possible substantive injustice towards the affected population?

With procedural dimensions, we have adapted Boström's (2012) categories to understand whether the projects have been empowering or disempowering towards the local affected population. This means explicitly to research whether the hydropower dam projects have been accountable in both governing and managing the process of building a hydropower dam and involving the local population. The second part of the empirical study will look at the procedural aspect of the two selected dams. The subquestion for this part is: how have the developers and builders implemented principles to make the governance process transparent, accountable, accessible and open to the participation of the local affected population?

### 3. Case Studies

China has become the most dominant international actor for international hydropower projects in recent years. While China has a long history of domestic dam building, Chinese dam builders are relatively new to the international dam industry and have had a rapid increase in activity in recent years. China is today the world's largest hydropower developer. Chinese dam builders differ from other dam builders due to the role of SOEs that are backed by abundant state funding; their own distinctive way of handling (and not seldom, disregarding) social and environmental impacts; and their pragmatic approach to regional politics and political alliances and their need for access to natural resources (Hensengerth 2013; Urban et al. 2013), as well as their low costs that make them outcompete OECD competitors. In addition, the Chinese government incentivises the bundling of aid, trade and investments, also for overseas hydropower dam projects (Urban et al. 2013).

Chinese dam builders tend to invest in countries and regions where the World Bank, the Asian Development Bank and other multilateral organisations usually tend to shy away from investing in hydropower developments, such as in Myanmar, Borneo and Sudan. With regard to Chinese overseas dam projects, there are currently more than 300 Chinese overseas dams of all sizes, most of them in Southeast Asia (38 per cent) and Africa (27 per cent) (Urban & Nordensvard 2014). Of these more than 170 are large dams already completed or currently under construction (International Rivers 2014). The largest hydropower dam building company in China is the SOE SinoHydro Corporation, which is subject to the rules and regulations of State-owned Assets Supervision and Administration Committee of the State Council (International Rivers 2008). Financial institutions like ExIm Bank and Sinosure also have a significant interest in hydropower development and are involved in the majority of China's overseas investments (Heinrich Böll Stiftung 2008). An estimated 60 per cent of Sinosure's medium- and long-term loan activity is for

China ExIm Bank transactions (McDonald et al. 2009).

Depending on the national circumstances, dam *builders* such as Sinohydro may in some cases have influence on decisions regarding where a dam should be built, as they can be involved in initiating surveys and planning the dam, and how it should be designed, engineered and constructed, which often includes major decisions about size of the dam, generating capacity, size of the reservoir that will flood the area etc. However often dam builders are asked by governments to build a dam at a certain location under certain conditions, hence limiting their decision-making power and making them only the executors of a dam project. In some cases, Sinohydro has acted as the project *developer* for Build-Own-Transfer projects. Developers are usually involved to some extent in the environmental impact assessment (EIA)/environmental and social impact assessment (ESIA) so that the environmental and social impacts of the dams are evaluated and mitigation measures are developed (such as resettlements and compensation, rescue missions for animals before the reservoir flooding, planting new trees after the flooding etc.). Compared with project contractors and builders, developers are therefore well aware of the full extent of the dam building and its impacts, and can make informed decisions about its sustainability and whether or not a project should go ahead. However, many of these decisions may also be taken by the national government and then requested to be implemented by a developer, such as Sinohydro. Sinohydro is usually the builder of dams, but in increasing number of projects Sinohydro is also the project developer. In some cases, such as for the Kamchay Dam in Cambodia, Sinohydro was the builder, contractor and developer.

We have chosen two dam projects that are built by Sinohydro and financed by ExIm Bank. This covers the largest builder and financier of Chinese overseas hydropower dams. These two dams have been chosen because they each represent a specific approach to Chinese dam building. We have chosen one dam in Africa and one in Southeast

Asia, where most of the Chinese overseas dams are located. Each dam involves the Chinese as dam developers and focuses on large dams of more than 50 MW (which tends to be the main size Chinese dam builders are investing in), where construction has recently been completed and where access to the dam sites, to local communities and national and local governments is favourable, hence allowing independent fieldwork.

Choosing two dams in two different countries enables us to assess whether there is a common approach to social sustainability of Chinese overseas hydropower dams such as implicit social standards or effective measures to remedy issues of substantive and procedural dimensions.

The Bui Dam in Ghana has a power generation capacity of 400 MW and a net average energy production of 980 gigawatt hours/year. It costs an estimated US\$621 million (International Rivers 2014). The dam started operation in 2013 (Environmental Resources Management (ERM) 2007). The financiers are China's Export Import (ExIm) Bank and the Ghana Government, while the builder is Sinohydro and the developer is Ghana's government (International Rivers 2014). The Bui Dam is the second largest dam in Ghana. It is located in the Northern/Brong-Ahafo Region on the Black Volta River at the Bui Gorge. Parts of the dam are located within the Bui National Park. The dam includes a reservoir occupying 440 km<sup>2</sup> of the Bui Gorge, which flooded 21 per cent of the total area of the Bui National Park.

The Kamchay Dam in Cambodia has a generating capacity of 193 MW and costs an estimated US\$280 million (International Rivers 2013), which was part of a bundled US\$600 million aid and investment package from China to Cambodia. This bundling of aid is unusual for OECD financiers, but common for Chinese financiers. The financiers are China's ExIm Bank, while the builders, developers and contractors are Sinohydro. Sinohydro started building the Kamchay Dam in Kampot Province, Southern Cambodia in 2006. The dam started operation in late 2011. The dam is located in Bokor National Park (Middleton 2008; Grimsditch 2012).

The project involves an interdisciplinary, multi-sited, comparative case-study approach that reflects the international scope of the complex interconnections between Chinese dam builders and low and middle income countries.

### 3.1 Data Collection

We first conducted a multilevel stakeholder mapping to identify key stakeholders engaged in Chinese overseas hydropower projects for each of the host countries. The outcome was used to guide the data collection. The fieldwork was conducted between 2012 and 2014 in Ghana and Cambodia. We first conducted a pilot study, then the fieldwork with local communities, followed by the fieldwork with local and national government authorities. This took about a year and a half for each dam, including conducting the pilot study.

For the Bui and Kamchay dams, we carried out in-depth interviews and focus groups with affected communities, local stakeholders and Chinese actors, for a total of 78 interviews and 20 focus group discussions (see Table 2 for details).

In addition to primary data that we collected throughout the fieldwork, we used supplementary data from secondary sources. The selection of the secondary data was based on the following selection categories: (i) technical

data about the dam, (ii) social and environmental impact data, and (iii) guidelines, standards, strategies and legal papers relating to the dam builders. For example, we used quantitative secondary data from International River's extensive database, which includes comprehensive up-to-date data about each of China's hydropower projects worldwide (for example, information about which organisations are the dam's contractor, developer, financier, costs of the dam, size, location, environmental, and social implications). We further used technical dam details from the GEO database. We also compiled secondary data to assess the environmental impacts of dams and their governance implications by examining the EIA reports of the dams. We also analysed dam project documentation and firm strategies, such as Sinohydro's environmental and social guidelines outlined in their handbook. This secondary data include information about Sinohydro's approach to social and environmental impacts, how they align themselves with the standards of other dam funders such as the World Bank, what they care about, and what is only mentioned on the margins (or not at all).

We coded the interview and focus group consultation data and used the Nvivo 10 software (QSR International, Melbourne, Australia) to analyse. These were analysed using narrative analysis (Wiles et al. 2005), which

**Table 2 Interview Set-Up**

<i>Targets</i>	<i>Methods</i>	<i>No. of interviews</i>	<i>Further details</i>
Affected communities Bui Dam project: (Bator, Bui, Gyama and Dokokyina) Kamchay Dam project: (Bat Kbal Damrey, Moat Peam, Ou Touch, Snam Prampir, Tvi Khan Cheung)	Focus groups	10 for Bui, 10 for Kamchay: 20 in total (5–10 people each; 150 people in total)	50% women; 50% men
Affected individuals	Semi-structured	46 (Bui: 25, Kamchay 21)	
Institutional actors	Semi-structured interviews	21	National/local government, NGOs
Chinese actors	Semi-structured interviews	11	Sinohydro, regulators and financiers
Total	Semi-structured interviews	78	
	Focus group discussions	20	

allows us to compare several cases to be able to draw parallels from similar findings and flag up any differences (Yin 2009).

## 4. Results

### 4.1 Substantive Dimension

The main social impacts of the Bui Dam in Ghana were the impacts on livelihoods, the loss of land and the resettlement of the affected people. The construction of the Bui Dam in Ghana caused the inundation of six villages. As a result, 1,216 people were relocated from their old villages to new settlements. In addition, 7,500 people from four villages lost access to farmland and forests (ERM 2007). Villages rely on farmland for crops and grazing mainly for subsistence. In the low season, fish is for subsistence; in the high season, fish is also sold on the market. Other livelihoods activities include hunting and gathering, and trading. After the construction of the dam livelihood, losses concerning farming and fishing activities have been reported by local residents.

Most of the resettled people interviewed reported losses of yields due to poor fertility of the soil of the new farming land provided to them by the Ghanaian government in the resettlement areas. Fishing activities have also decreased due to difficulties to access the river, which is far away from the new settlement sites compared with previous settlements. Moreover, even though fishing communities have now access to the reservoir for fishing, local people stated that they do not have the necessary skills to fish in the lake. They also reported that some people died during fishing in the reservoir due to the lack of experience. To be more specific, the interviewed fishermen at the Bui Dam site reported that fishing in the lake is more dangerous than fishing in the river due to the presence of strong winds and the formation of big waves and currents. The reservoir is in fact less protected by vegetation from winds than the river, partially due to the clearance of the forest for the construction of the dam. Fishermen do not have the required skills and knowledge to fish in the lake under these new conditions also because the old

boats fishermen were using to fish in the river have problems of stability in the reservoir. These new circumstances have caused several incidents, and some cases of death were reported.

It has also been reported by the interviewees that a number of the fishermen had been arrested because they are not allowed to fish in parts of the river, which falls within a protected game reserve in Bui National Park. Those who were collecting forest products, such as women collecting shea nuts for sale, are not able to engage in these activities effectively post-resettlement because of the distance to the forest area. The reduced activities have a negative impact on the livelihoods of the local population and even affect food security. Most of the affected people are subsistence farmers. They do not know exactly how much of their livelihoods decreased as they only farm for their own use. They find it hard to quantify the changes, but they report that the quality of the new land is low and the soil is rather infertile, which makes agriculture difficult and affects their food security. Declines in livelihoods of the resettled communities are therefore a major negative impact of the dam.

Regarding land compensation, since farming is not allowed in a national park in Ghana, monetary compensation for the loss of land due to inundation has been provided only to chiefs and families who lose farming land that was located outside of the Bui National Park or to those with land titles or registration. The interviewees reported that those who farmed on land within the national park boundaries did not receive monetary compensation for loss of land. Cash compensation for crops has been paid according to the harvest or market value for lost cash crops, based on the average annual market value over crops for the previous 3 years. This is, however, a problem as monetary compensation of crops is only a one-off payment, while the loss of the crops is being felt year after year and means families have instable food arrangements year after year.

According to the Bui Dam Resettlement Planning Framework (RPF), 'land for land' compensation must be provided based on the



principle of equivalent land productivity and the size of the land (ERM 2007). However, communities' members received very small sizes of the land after resettlement, which are less fertile. The land was measured by Ghanaian government agencies before the resettlement. After the resettlement, the affected people got a different plot of land as a compensation for the land taken from them. The government agencies said they measured the new land, and it has the same size as the old land, but the affected people reported during the fieldwork that the land is smaller; however they have not measured either land sizes. The main issue at the Bui Dam resettlement sites is, however, not the land size, but the fertility of the soil, which is reported to be of much lower fertility than the old land. Crops do, therefore, not grow as well as they did before, affecting food security and incomes for resettled families. Households who lost farmland due to the dam flooding were entitled to receive cash payments for crops and trees, and they were also eligible for livelihood and rehabilitation programs in case they lost more than 20 per cent of their land. An example of this is Livelihoods Enhancement Programme, which provides a safety net for households directly impacted by the project through assistant programs including microcredits, and training programs (RPF 2007). While social protection measures exist in theory, the resettled people are still waiting for these measures to be implemented, as no formal social protection programs have been implemented yet.

Our interviews reveal that the following measures were part of the compensation program: new housing facilities in the new settlement area; replacement compensation for fixed assets, such as schools, clinics and community centres; and water and sanitation facilities. After the construction of the dam, resettled communities were provided with electricity, sanitation and water facilities. However, the interviews revealed that the quality of some of the facilities provided has been questioned by resettled people. Sanitary facilities, such as toilets, are not used by the majority of the households due to malfunctioning, as was reported by some of the villagers

interviewed in different resettled communities, namely Battor, Bui, Jama and Dokokyina. Field evidence, however, shows that overall adequate housing facilities have been provided, and residents in the resettled areas stated to be generally satisfied with the new houses.

The construction of the Kamchay Dam in Cambodia has a series of severe impacts on the local population. There are approximately 22,000 people living in the rural area that is directly affected by the dam in Kampot province (NGO Forum Cambodia 2013). However, different from the Bui Dam, no resettlements have taken place to date. The reservoir has been filled in an area that was not inhabited, located in Bokor National Park, which was used by the locals for income-generating activities, mostly to collect bamboo for making baskets and selling them on the local market.

The bamboo collectors are the biggest group that has been adversely affected by the dam. They depend on bamboo collection for their livelihoods as they collect bamboo to make baskets. Most of the bamboo collectors do not have any other sources of income, many of them do not own any land nor have any assets, and most of them have very low literacy rates and can therefore not easily move on to more skilled jobs. The dam has flooded the bamboo forest area that the villagers used for bamboo collection. The dam, therefore, meant a loss of livelihoods for many bamboo collectors. While the main bamboo collection area is flooded, the villagers have found another smaller bamboo forest site that is further away and now belongs to the land owned by Sinohydro. Our interviews reveal that occasionally Sinohydro puts a ban on bamboo collection and closes off access to the area completely, sometimes up to 2 weeks at a time. This means that the villagers do not have any income for 2 weeks and have instead started borrowing money from microcredit institutions. With no other income sources, the local people are however not able to repay the loans. Our fieldwork revealed that many of the villagers are therefore experiencing extreme financial hardship, are experiencing adverse impacts on food

security, and are considering options such as moving to Phnom Penh or even Thailand as migrant workers to secure their livelihoods.

The second group of people who are affected by the dam are the fuel wood collectors. They face a similar situation to the bamboo collectors, although access to parts of the forest areas is currently banned by the Cambodian government for fuel wood collectors due to forest conservation efforts, and there is a ban on trucks and engine boats on the reservoir.

The third group of people who are negatively affected by the dam are the fruit sellers at Teuk Chhu riverside resort who are dependent on income from tourism. As the river is often dry since the dam construction, the tourist numbers have declined by about 80 per cent in 2013 as the affected locals' report, which is being confirmed by other reports (NGO Forum Cambodia 2013). The sellers who depend on tourism also mentioned that their incomes have declined by about 80 per cent compared with before the dam, making it very difficult to provide an income for their families. Unlike in the Bui Dam case, there are no schemes for training/livelihood/other employment options for the people adversely affected by the Kamchay Dam.

The fourth group of people who are impacted by the dam are the durian growers and other plantation owners. Some of them received compensation by Sinohydro for land that was lost due to the construction of the dam. Rather than compensating for the land, Sinohydro compensated the affected families for the lost trees. The villagers reported that a lost banana tree was compensated at US\$10, a mango tree at US\$30, a durian tree at \$100–500 depending on size and age. Compensation was paid to villagers who lost their rice fields, however only at US\$3 per square metre, which the villagers considered too low. Rice was only planted for subsistence by the local population, not for commercial purposes. As rice paddies have been lost, the affected families now need to purchase rice rather than grow their own. This has had adverse effects on food security.

Several families live under the power lines that were constructed for electricity transmis-

sion from the dam to urban areas. Our interviewees report that these people were supposed to be resettled; however, this has not happened yet, and it is not clear yet how and when they will be compensated and relocated. No other resettlement took place; hence, housing and relocation are not an issue.

Regarding fishing, only a few people fish near the Kamchay Dam, most of them prefer fishing in the nearby sea. Two major ecological changes are occurring due to the dam blocking the natural flow of the water. First, as the Kamchay Dam is located close to the sea, it blocks the Kamchay river's freshwater flow upstream, which means that downstream the river's water is much saltier than before the dam construction. This has a negative impact on fish and other aquatic species as freshwater species cannot inhabit this salty, altered riverine ecosystem. Second, every year in the monsoon season, Cambodia experiences the reversal of the water flow from the sea inland due to heavy rains. This is exemplified at Tonlé Sap lake, which expands and shrinks significantly with the seasons as the water flow changes directions. This phenomenon is far less pronounced at the Kamchay river, although the local population told us during the fieldwork that the water flow does reverse to some extent. This is now not happening as the dam is blocking the river. Hence, fish and other aquatic organisms cannot migrate up the river in the rainy season. For these two reasons, the abundance and diversity of fish and other aquatic organisms has decreased; hence, river fishing has become less desirable than before for the local population.

Ironically, many of the people living next to the Kamchay hydroelectric dam do not have access to electricity. The fieldwork reveals that only about a third of villages around the Kamchay Dam have access to electricity from the dam, and out of these villages only about 15–20 per cent of households have access to electricity. Nevertheless, for those who have access to electricity, the price of electricity has been reduced from 1,800 Riel per kWh to 920 Riel per kWh. This is, however, higher than the initially mentioned 500–600 Riel per kWh that was promised by Sinohydro, as our

interviewees report. Even though electricity has become more affordable, many people do not have the financial means to connect to the grid as it requires a connection fee of US\$160 per household, as the villagers report.

#### 4.2 Procedural Dimension

Most of the procedural aspect of the Bui Dam project has focused on creating accountable governance and management. This includes the management and implementation of the ESIA of the dam, the RPF, and the mitigation plan that details measures for reducing the environmental and social implications of the dam. According to government officials, the ESIA was commissioned before the construction of the dam by the Ministry of Energy of the Ghanaian government and carried out by the UK firm Environmental Resources Management (ERM). The contract with Sinohydro was a turnkey contract or EPC contract (engineering, procurement, construction).

According to the environmental regulations in Ghana, before a development project receives an approved environmental permit, the ESIA has to be issued and presented to the Environment Protection Agency. Only when the environmental permit is obtained the loan agreement with the project funder, in this case China ExIm Bank, can be signed (Hensengerth 2011). Environmental regulations and standards in Ghana are relatively strong, and they reflect international standards, particularly those developed by the World Bank, and standards of the International Organisation for Standardisation (Hensengerth 2011).

The Chinese are neither directly involved in the ESIA nor the resettlement of the local population. Instead, a new local authority was created by the Ghanaian government for the management of the dam and its impacts, including the implementation of the resettlement plan, namely the Bui Power Authority (BPA 2007). The BPA was established by an Act of Parliament, BPA Act 740, in 2007 by the Ghanaian Government for the planning, execution and management of the Bui Dam project. The main functions of the BPA include the generation of electrical power, the opera-

tion of the dam, the construction of the transmission lines and system, the supply of the electrical power generated at the dam, the provision of facilities and assistance for the use of the lake created by the construction of the dam, as well as the development of activities at the dam area.

The interviewees mentioned that the social monitoring has been delegated to the project owner BPA, and since above permits are granted to BPA it also has the responsibility to monitor Sinohydro's adherence to permits' conditions. Obligations of the contractor (in this case Sinohydro) is the implementation of a construction management plan, including dealing with the workforce and local residents, ensuring health and safety, and 'good house-keeping' (ERM 2007, p. 1). Finally, Sinohydro was involved in some of the monitoring activities together with several governmental agencies. Local people affected by the dam, such as those who were later resettled, were invited to attend consultation meetings. However, not all relevant issues were discussed at the consultation meetings. Some of the affected people regretted in the interviews the fact that they were not consulted regarding decisions about the resettlement site, which is less diverse in terms of vegetation and lower in soil quality than the location of the previous villages. Nevertheless, the respondents indicated that most of them took part in consultation meetings that addressed the impacts of the dam, the upcoming need for resettlement and compensation measures. However, the lack of a consultation process to identify challenges and post-project construction issues and claims has been reported by interviewees and in other recent studies (Doh & Andoh 2014). The actors who conducted the consultation meetings were Ghanaians, not Chinese stakeholders, as the interviewees report.

The governance and management process in the Kamchay Dam project have been markedly different from the Bui Dam. The Kamchay Dam contract between Sinohydro and the Cambodian government is a build, operate, transfer contract (BOT). Sinohydro will transfer the ownership of the dam to the Cambodian government after 44 years, in 2050.

The government authorities that are responsible for dams in Cambodia are the Ministry of Industry, Mines and Energy (MIME), the Ministry of Water Resources and Meteorology (MOWRAM) and the Ministry of Environment (MoE). MIME is the government authority that makes the main decisions for dam building in Cambodia and the authority that deals directly with the dam builders.

All BOT projects, such as the Kamchay Dam, have to be approved by the Council for the Development of Cambodia. There is a Law on Water Resource Management, and all hydropower projects require a water use licence from MOWRAM (Grimsditch 2012). The main legal framework for the EIA is the sub-decree on EIA passed by MoE in 1999. The EIA has to be approved by several ministries, including those mentioned above. According to the interviewees, the MoE is primarily responsible for organising the conduction of the EIA, reviewing the report and monitoring compliance with environmental legislation. Accountability is generally weak for failings related to the dam. There have been serious shortcomings with regard to the Environmental and Social Impacts Assessment (ESIA). By Cambodian law, development projects such as dams are required to have an EIA in place and approved before the construction process begins. Cambodian law also prescribed that the EIA process should be transparent, the decision-making should be accountable, and a wide consultation process should involve affected local communities and civil society organisations (Middleton 2008; NGO Forum Cambodia 2013). However, at the Kamchay Dam, the EIA process was seriously flawed. The EIA process started late, and the EIA approval was in fact granted 7 months after the inauguration of the dam, as interviewees point out. Overall, the implementation of environmental and social safeguards is minimal and not in line with Cambodian legislation, as the interviews revealed. In addition, the Environmental Management Plan (MEP), which aims to implement mitigation measures to reduce the negative effects of the dam, was not in place until the late stages of the dam construction. It is also being reported by gov-

ernment officials, locals and civil society that Sinohydro has not implemented any mitigation measures. Sinohydro is said to have set aside a so-far untouched budget of US\$5 million for implementing mitigating measures; however, even government officials are criticising Sinohydro for its inaction.

The consultation processes before the dam construction were patchy and ad hoc with little local participation as our fieldwork finds and other reports confirm (International Rivers 2013). Many villagers were not invited to consultation processes and became only aware of the dam once construction had started. There are also a range of unresolved complaints from the local population, for example due to the closure of the bamboo forest area. The local villagers have complained against Sinohydro in various forms (petitions, mass demonstrations, filing individual complaints). Nevertheless, they had to follow a strict hierarchy addressing first the village chief, then the commune authority, then the district authority, then the provincial authority, and from there on the complaints are said to be taken to the appropriate ministries in Phnom Penh (mainly MIME), who then establishes a communication with Sinohydro. This is despite Sinohydro's offices being based at the dam site, in very close proximity to the affected villages.

## 5. Discussion and Conclusion

Our research findings suggest that both the Bui and Kamchay dams have disparate social implications for the local population. However, the mechanisms that are designed to handle these social implications are very different in Ghana and Cambodia. This implies that one cannot generalise that Chinese dam building is standardised or normalised. The research concludes that Chinese builder Sinohydro and financier ExIm Bank can follow social standards for planning and implementing hydropower dams, if requested to do so by the national government. If however the national government does not request social standards, dam builders can circumvent them.

The comparison highlights that there is no standard procedure for handling the social implications of Sinohydro's dam projects. The Bui Dam is an *Engineering, Procurement, Construction (EPC) contract*, which is a turnkey contract in which the Chinese dam builders Sinohydro are the contractors who build the dam and then transfer the ownership and daily management of the dam to Ghana's government. This makes Ghana's government in charge of the resettlement process, of compensating the affected local people, of implementing mitigating measures to reduce the adverse environmental and social impacts of the dam, and of managing the dam and its impacts on a daily basis. In 2007, the BPA was established to plan, implement and manage the dam. Once the dam had been built, the ownership of the dam was transferred from Sinohydro to the Ghanaian government, with the BPA being the main dam authority. Some social safeguard programs are in place, at least in theory, although their actual implementation remains weak.

The Kamchay Dam on the other hand is a *Build, Operate, Transfer (BOT) contract*, which means that the Cambodian government grants a concession to Sinohydro for recovering its investment by allowing the dam builder to own and operate the dam for 44 years and to sell electricity to the grid. After the 44 years of ownership by Sinohydro, the dam ownership will be transferred to the Cambodian government, albeit after the peaking of the economic lifetime of the dam. Technically, this makes the dam builder Sinohydro in charge of either finding a contractor or dealing with critical issues themselves, such as the resettlement process (which was not needed at the Kamchay Dam), of compensating the affected local people, of implementing mitigating measures to reduce the adverse environmental and social impacts of the dam, and of managing the dam and its impacts on a daily basis. In reality however, Sinohydro operates and manages the dam, but leaves dealing with the social and environmental impacts of the dam largely to the local authorities. MIMC is the main Cambodian authority responsible for dam building and for dealing with Sinohydro. MoE

and the provincial Department for the Environment have less decision power over the dam and are expecting Sinohydro to fully take up its contractual responsibilities, such as paying the outstanding payments for mitigating measures. While a BOT contract technically makes the contractor, builder and operator (in this case Sinohydro) in charge of the dam and its social and environmental impacts, some of these cumbersome tasks seem to be left to the Cambodian authorities to deal with at the Kamchay Dam, such as in relation to the complaints from affected communities.

The case studies highlight that the dam projects could improve their social sustainability framework in practice and theory, and that social policies need to be improved for Chinese overseas dams to be in line with international social standards on hydropower projects. The research finds reluctance by the dam builders and its financiers to implement important aspects of substantive justice, such as setting a minimum standard for social protection of the local communities. This may be seen in contrast to international attempts to create guidelines and social performance standards. The WCD attempted in 2000 to develop a framework entitled *Dams and Development: A New Framework for Decision-Making* that could facilitate the planning, implementation and operation of dams. The International Hydropower Association (IHA) launched their own sustainability guidelines in 2004, which was followed by their Hydropower Sustainability Assessment Protocol in 2006, which has also been translated into Chinese. There has also been a rise in assessment techniques, such as social impact assessment, multi-stakeholders platforms and transboundary environmental impact assessments (Mirumachi & Torriti 2012) The International Finance Corporation (IFC) has, as a part of the World Bank Group, created Environmental and Social Performance Standards and Guidance Notes for investment that have been regularly updated and have become a norm for large overseas investment. For example, IFC's sustainability framework includes performance standards that apply to all investment and advisory clients

whose projects go through IFC's initial credit review (IFC 2012).

Interestingly, Sinohydro was about to implement a minimum standard in their Policy Framework for Sustainable Development in 2011, which outlined a catalogue of commitments for social sustainability. The resettlement commitments were, for example, influenced by World Bank-related documents, such as the IFC performance standard documents, and also contained legal compliance and environmental assessment policies driven by Sinohydro's own policy documents. The policy also mentioned no dams should be built in national parks. This policy was, however, superseded by weaker and vaguer policy documents in 2013 and 2014. At the moment, Chinese dam builders do not seem to shy away from investing in environmentally protected areas, such as national parks, as is the case both in Ghana (Bui National Park) and Cambodia (Bokor National Park). Hensengerth (2013) indicates that no investors and dam builders from the OECD dared to finance and build the Bui Dam due to its major environmental and social impacts. Attempts from OECD companies such as Halliburton fell short, and in the end the Ghanaian government opted for Chinese funders and dam builders, namely ExIm Bank and Sinohydro. There is a lack of political will to implement minimal standards to prevent cases of procedural and substantive environmental injustice. This might highlight that corporative self-regulation has met its greatest challenge in Chinese corporations, such as Sinohydro and ExIm Bank. Some academics argue further that a new approach to the regulation of corporate social responsibility is needed (Altman & Vidaver-Cohen 2000; Waddock & Smith 2000).

The main research question of this article was to evaluate how Chinese hydropower projects built by Sinohydro and financed by ExIm Bank ensure social sustainability towards the local affected population. This was done by analysing the social sustainability of two Chinese hydropower dams in Ghana (Bui Dam) and Cambodia (Kamchay Dam), drawing on 78 interviews, 20 focus group discussions and document analysis. The research

concluded that social sustainability varies from dam to dam as Chinese dam builders lack an overall standardised code of conduct regarding social impacts. This also means the degree to which the social rights of the affected communities are ensured is rather variable. The individual hydropower project is dependent on the local conditions of governance, as well as on the type of contract. There seems to be a reluctance to implement a minimum social standard for hydropower dams built and financed by Sinohydro and ExIm Bank. Our research analysed the impacts on the social welfare of the affected population and how these impacts had been mitigated, as well as how the dam builders implemented an accountable and participatory governance process. The impacts with regard to livelihoods and social welfare were severe in both dam cases. Most strikingly, we found differences between the governance process in Ghana, which was more accountable and participatory, versus Cambodia, which was less accountable and participatory.

To conclude, we suggest that there needs to be a global benchmark system that ranks hydropower firms and investors according to their social and environmental performance. In addition, a global code of conduct for social and environmental sustainability for international hydropower projects should be followed by all hydropower firms and investors. A wide range of different regulatory bodies and guidelines already exist for large infrastructure investments and dam building; however, none of these are standardised across the hydropower industry. The most well-regarded and widely accepted guideline today is the IHA's Hydropower Sustainability Assessment Protocol, which we suggest should be implemented by Chinese dam builders too. In addition, a global benchmarking system could review large dam builders and their social impact performance on a regular basis. This would evaluate and rank the social performance of Chinese, OECD, Brazilian, Thai and any other dam builder. This may require the active role of the civil society, which has already in the past flagged up many grievances and which actively monitors the dam industry and its

impacts. These recommendations are not only valid for Chinese dam builders, but for other dam builders from any other country or organisation.

With regard to further research needs, this is a relatively new field for social policy research, which links into wider research on social policy and the environment. This research field relates to social policy that centres around big infrastructure projects and their social and environmental impacts. It thereby links into a wide range of social policy issues such as human well-being and welfare, social protection, the rights of marginalised people, food security, livelihoods, social and environmental justice, state-building etc. It is a yet under-researched but increasingly important and topical research that deserves more attention in academic literature.

July 2015.

## References

- Agyeman J, Evans B (2004) 'Just Sustainability': The Emerging Discourse of Environmental Justice in Britain? *The Geographical Journal* 170(2), 155–64.
- Altman BW, Vidaver-Cohen D (2000) A Framework for Understanding Corporate Citizenship. *Business and Society Review* 105(1), 1–7.
- Bosshard P (2009) China Dams the World. *World Policy Journal* 26(4), 43–51.
- Boström M (2012) A Missing Pillar? Challenges in Theorizing and Practicing Social Sustainability: Introduction to the Special Issue. *Sustainability: Science, Practice, & Policy* 8(12), 3–15.
- Bui Power Authority (BPA) (2007) Bui Power Authority Act, viewed August 2015 <<http://www.buipowerauthority.com/legalstat.htm>>.
- Bullard RD (1999) Dismantling Environmental Racism in the USA. *Local Environment* 4(1), 5–19.
- Carruthers DV (2008) The Globalization of Environmental Justice: Lessons from the U.S.-Mexico Border. *Society and Natural Resources* 21(7), 556–68.
- Decarboni.se (2014) *Chinese Dam-Building Company Standards and Policies*, viewed August 2015 <<http://decarboni.se/publications/new-great-walls-guide-china%E2%80%99s-overseas-dam-industry/chinese-dam-building-company-standards-and-policies>>.
- Deutsch M (2000) Justice and Conflict. In: Deutsch M, Coleman PT (eds) *The Handbook of Conflict Resolution: Theory and Practice*, pp. 45–65. Jossey-Bass Inc. Publishers, San Francisco.
- Doh D, Andoh PK (2014) *Monitoring of Natural Resource Governance. Assessment of Changes in Policy and Practice as a Result of the Multi-Stakeholder Ghana Dams Dialogue*. IIED Final Report, viewed August 2015 <<http://pubs.iied.org/pdfs/G03773.pdf>>.
- Environmental Resources Management (ERM) (2007) *Environmental and Social Impact Assessment Study of the Bui Hydroelectric Power Project*. ERM Reference 0042911.
- Faber DR (2005) Building a Transnational Environmental Justice Movement: Obstacles and Opportunities in the Age of Globalization. In: Bandy J, Smith J (eds) *Coalitions across Borders: Transnational Protest and the Neoliberal Order*, pp. 43–68. Rowman & Littlefield, Lanham, MD.
- Grimsditch M (2012) *China's Investments in Hydropower in the Mekong Region: The Kamchay Hydropower Dam, Kampot, Cambodia*, viewed August 2015 <<http://www.bicusa.org/wp-content/uploads/2013/02/Case+Study+-+China+Investments+in+Cambodia+FINAL+2.pdf>>.
- Hall A (2007) Social Policies at the World Bank: Paradigms and Challenges. *Global Social Policy* 7(2), 151–75.
- Harvey D (1996) *Justice, Nature and the Geography of Difference*. Blackwell Publishers, Oxford.
- Heinrich Böll Stiftung (2008) *Rethinking Investments in Natural Resources: China's Emerging Role in the Mekong Region*. Policy Brief, WWF and International Institute for Sustainable Development.
- Hensengerth O (2011) *Interactions of Chinese Institutions with Host Governments in Dam*

- Construction. *The Case of the Bui Dam in Ghana*. DIE/GDI Discussion Paper 3/2011, DIE/GDI, Bonn.
- 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* 15(2), 285–300.
- International Finance Corporation (IFC) (2012) *Environmental and Social Performance Standards and Guidance Notes*, viewed August 2015 <[http://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/ifc+sustainability/our+approach/risk+management/performance+standards/environmental+and+social+performance+standards+and+guidance+notes](http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/performance+standards/environmental+and+social+performance+standards+and+guidance+notes)>.
- International Rivers (2008) *The Three Gorges Dam: The Cost of Power*, viewed August 2015 <<http://www.internationalrivers.org/resources/china-s-three-gorges-dam-a-model-of-the-past-2638>>.
- International Rivers (2012) *The New Great Wall: A Guide to China's Overseas Dams Industry*, viewed August 2015 <<http://www.internationalrivers.org/resources/the-new-great-walls-a-guide-to-china%E2%80%99s-overseas-dam-industry-3962re>>.
- International Rivers (2013) Chinese Dams Database. International Rivers, Berkley.
- International Rivers (2014) *Chinese Overseas Dams Database*. Berkeley, USA.
- Karjalainen TP, Järviöskö T (2010) Negotiating River Ecosystems: Impact Assessment and Conflict Mediation in the Cases of Hydro-Power Construction. *Environmental Impact Assessment Review* 30, 319–27.
- McDonald K, Bosshard P, Brewer N (2009) Exporting dams: China's hydropower industry goes global. *Journal of Environmental Management* 90, 294–S302.
- Middleton C (2008) *Cambodia's Hydropower Development and China's Involvement*. Rivers Coalition Cambodia, Phnom Penh.
- Mirumachi N, Torriti J (2012) The Use of Public Participation and Economic Appraisal for Public Involvement in Large-Scale Hydropower Projects: Case Study of the Nam Theun 2 Hydropower Project. *Energy Policy* 47, 125–32.
- 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.
- Nordensvard J, Urban F, Mang G (2015) Social Innovation and Chinese Overseas Hydropower Dams: The Nexus of National Social Policy and Corporate Social Responsibility. *Sustainable Development* 23, 245–56.
- Pulido L (1996) *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest*. The University of Arizona Press, Tucson, AZ.
- Resettlement Planning Framework (RPF) (2007) *Resettlement Planning Framework for the Bui Hydropower Project*. Prepared by Environmental Resources Management, in association with SGS Environment, Accra.
- Schlosberg D (2004) Reconceiving Environmental Justice: Global Movements and Political Theories. *Environmental Politics* 13(3), 517–40.
- Schlosberg D (2007) *Defining Environmental Justice*. Oxford University Press, Oxford.
- Schlosberg D (2013) Theorising Environmental Justice: The Expanding Sphere of a Discourse. *Environmental Politics* 22(1), 37–55.
- Schroeder R, Martin KS, Wilson B, Sen D (2008) Third World Environmental Justice. *Society & Natural Resources* 21(7), 547–55.
- Shrader-Frechette K (2002) *Environmental Justice: Creating Equality, Reclaiming Democracy*. Oxford University Press, New York.
- Sinohydro (2011) *Policy Framework for Sustainable Development*. Sinohydro, Beijing.
- Sinohydro (2013) *Occupational Health, Safety and Environmental Policy*, viewed August 2015 <<http://eng.sinohydro.com/uploadfile/2013/0530/20130530025657176.pdf>>.
- Sinohydro (2014a) *Statement of Ethical Principles*, viewed August 2015 <<http://>



- eng.sinohydro.com/uploadfile/2014/0529/20140529074921355.pdf>.
- Sinohydro (2014b) *Sustainable Development Policy*. Sinohydro, 2014. Sustainable Development Policy.
- Sze J, London JK (2008) Environmental Justice at the Crossroads. *Sociology Compass* 2(4), 1331–54.
- Turner RL, Wu DP (2002) *Environmental Justice and Environmental Racism: An Annotated Bibliography and General Overview, Focusing on U.S. Literature, 1996–2002*. Department of Environmental Science, Policy and Management, University of California, Berkeley.
- Urban F, Nordensvard J (2014) *China Dams the World: The Environmental and Social Impacts of Chinese Dams*. E-International Relations, viewed August 2015 <<http://www.e-ir.info/2014/01/30/china-dams-the-world-the-environmental-and-social-impacts-of-chinese-dams/>>.
- Urban F, Nordensvärd J, Khatri D, Wang Y (2013) An Analysis of China's Investment in the Hydropower Sector in the Greater Mekong Sub-Region. *Environment, Development and Sustainability* 15(2), 301–24.
- Waddock S, Smith N (2000) Relationships: The Real Challenge of Corporate Global Citizenship. *Business and Society Review* 105(1), 47–62.
- Walker G (2009) Globalizing Environmental Justice. *Global Social Policy* 9(3), 355–82.
- Walker G, Bulkeley H (2006) Geographies of Environmental Justice. *Geoforum; Journal of Physical, Human, and Regional Geosciences* 37(5), 655–9.
- Wiles R, Heath S, Crow G, Charles V (2005) *Informed Consent in Social Research: A Literature Review*. ESRC National Centre for Research Methods. NCRM Methods Review Papers NCRM/001, viewed August 2015 <<http://eprints.ncrm.ac.uk/85/1/MethodsReviewPaperNCRM-001.pdf>>.
- World Commission on Dams (WCD) (2000) *Dams and Development: A New Framework for Decision-Making*. Earthscan, London.
- World Commission on Environment and Development (1987) *Our Common Future*. Oxford University Press, Oxford.
- Yin R (2009) *Case Study Research: Design and Methods*. Sage, Thousand Oaks, CA.