Political Ecology of Kamchay Hydropower Dam

Introduction

Cambodia urgently needs to generate electricity to power its economic development and bridge its energy gap. The overall electrification rate is just 42.72 percent, with 3.16 million households connected to the national power grid (EAC 2014). Electricity coverage in rural areas is much lower than the country average. Domestic generating capacity in 2013 was only 1770 GWh—nearly 43 percent from diesel, coal and biomass, and about 57 percent from hydropower (EAC 2014). The volume of electricity imported from neighbouring countries was 2282 GWh, of which 44 percent came from Thailand, 25 percent from Vietnam and 1 percent from Laos (EAC 2014). Electricity costs in Cambodia are among the highest in the ASEAN region. Domestic electricity tariffs in 2011 ranged from 8.54 to 15.85 US cents per kilowatt hour (ASEAN Centre for Energy 2011).

Given the opportunities offered by the country's topography (narrow valleys, fast-flowing streams and powerful rivers), as well as foreign investment (mostly by Chinese firms) in energy infrastructure, the Royal Government of Cambodia is giving high priority to developing hydropower resources. The expectation is that increased power supplies will decrease and help stabilise future electricity prices. The Ministry of Mines and Energy (MME) and the Mekong River Commission (MRC) estimate that the country's technically exploitable hydropower capability is about 10,000 MW. Ten percent of the potential was under construction in 2011, and memorandums of understanding for an additional 2200 MW have been signed (Gätke and Un 2013).

Large dams have always attracted much controversy, usually related to their socio-economic impacts and environmental sustainability (Siciliano et al. forthcoming). Main biological impacts are changes in aquatic species composition in the river, blocked fish migration routes between feeding, spawning and nursing grounds, blocked sediment and nutrient flows, inundation of agricultural land and loss of terrestrial fauna and flora. Changes in river morphology, land use, water flow and water quality, such as increased salinity in downstream areas near the coast, are the physical effects. Forced relocation of people, loss of natural resources, restricted or denied access to resources, changes in livelihoods and agricultural practices, and river water not suitable for domestic or agricultural use are some of the impacts on local economies. Biophysical and socio-economic impacts of large dams are inevitable. However, the severity of adverse impacts depends on the size of the dam and reservoir. Moreover, because of cost overruns and project delays, not all dams are economically advantageous (Ansar et al. 2014 and Sovaool et al. 2014 cited in Siciliano et al. forthcoming).

Energy sector development, especially hydropower, is new for Cambodia, and large infrastructure projects require foreign assistance and investment. While the government and its development partners focus on the benefits of hydroelectric power production, the risks associated with dam construction are less well understood among policy and decision-makers. This has resulted in scant attention paid to the adverse effects of dam development and ways of mitigating risks.

This article draws on a larger study[1] undertaken to provide a better understanding of the governance arrangements of Kamchay hydropower dam and its socio-economic and environmental impacts, with a focus on changes in the livelihoods of people living in the immediate vicinity of the dam.

Case study of Kamchay dam

The 194-MW Kamchay dam was built by Sinohydro, a Chinese company. It was the largest one in the country until the 338-MW Russei Chrum Krom River dam was installed in January 2015. Although the precise extent of Kamchay dam's impact remains

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Figure 1: Kamchay hydropower dam, Kampot province

uncertain, the distribution of social, economic and environmental costs and benefits among actors on different levels and scales is clearly unequal. This dam development tests the government's ability to mitigate negative impacts and resolve inequalities between those who benefit and those who lose out. There are important lessons to be learned for future hydropower dam projects.

Kamchay dam construction and operation have considerable effects on the environment and consequent impacts on natural resources and local resource users. This calls for a better understanding of the implications of dam development that can contribute to shaping policy and decision making at national and local levels.

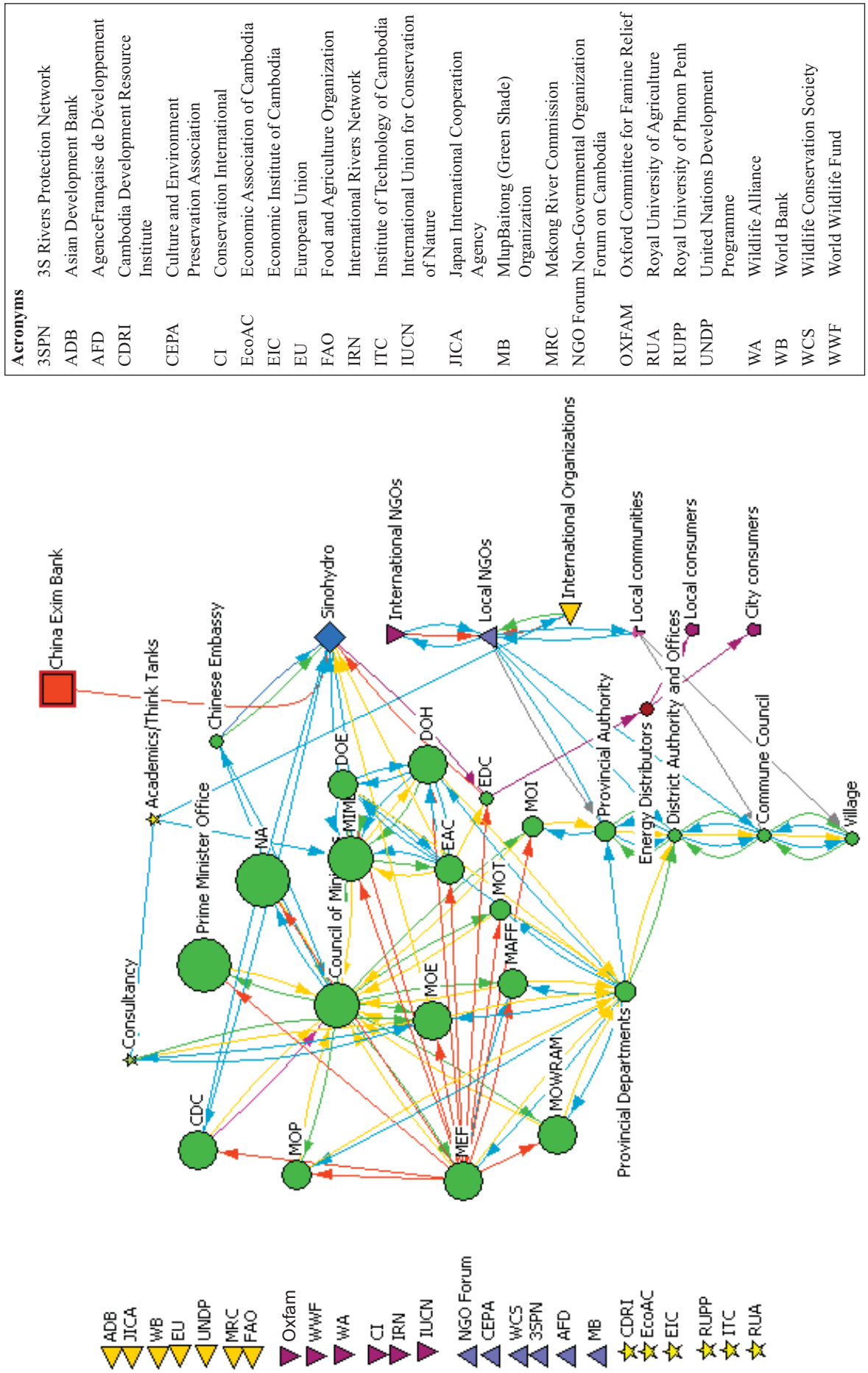
The main research objectives are to understand (1) the impacts of the dam on society, local economies and the environment, and (2) governance arrangements and decision-making processes regarding the hydropower dam. To that end, the study explores two key research questions:

- What are the direct and indirect social, environmental and economic impacts of the Kamchay dam at local and national scales?
- What are the governance arrangements regarding the development and operation of the Kamchay hydropower dam?

Method

Theoretical framework

Political ecology serves as the analytical framework to identify underlying political and socio-economic impacts, reproduced in environmental change, of Kamchay dam. Other scholars have used a similar framework to study conflicts over access to, and control over, natural resources such as water and energy (Wolf 1972; Greenberg and Park 1994). Central to the framework are the complex interactions between different actors at various levels (Tan-Mullins 2007): assessment of the unequal power relations between actors helps to explain the uneven distribution of access to and control over environmental resources.



Acronyms

3SPN	3S Rivers Protection Network
ADB	Asian Development Bank
AFD	AgenceFrançaise de Développement
CDRI	Cambodia Development Resource Institute
CEPA	Culture and Environment Preservation Association
CI	Conservation International
EcoAC	Economic Association of Cambodia
EIC	Economic Institute of Cambodia
EU	European Union
FAO	Food and Agriculture Organization
IRN	International Rivers Network
ITC	Institute of Technology of Cambodia
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
MB	MlupBaitong (Green Shade) Organization
MRC	Mekong River Commission
NGO Forum	Non-Governmental Organization Forum on Cambodia
OXFAM	Oxford Committee for Famine Relief
RUA	Royal University of Agriculture
RUPP	Royal University of Phnom Penh
UNDP	United Nations Development Programme
WA	Wildlife Alliance
WB	World Bank
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund

Figure 2: Institutional actors involved in decision making for Kamchay dam

The interdisciplinary nature of political ecology means that there are differences in emphasis in its definition. However, three assumptions developed by Bryant and Bailey (1997, 28-29) ground the practice of political ecology in developing countries.

- First, the costs and benefits associated with environmental change are distributed unequally.
- Second, this unequal distribution inevitably reinforces or reduces existing social and economic inequalities.
- Third, the unequal distribution of costs and benefits and the reinforcing or reducing of pre-existing inequalities holds political implications in terms of the altered power relationships that result.

Fieldwork

This study took a qualitative interdisciplinary approach, and drew on primary and secondary data. Secondary data was collected from a desk review of information and studies on Kamchay and other hydropower dams in Cambodia, international guidelines and policies on dam development, and national policies and legislation for energy security, dam construction and operation.

Primary data was gathered from semi-structured interviews (SSIs) and focus group discussions (FGDs) held with institutional actors in Phnom Penh capital and with local people living in affected communities at the dam site in Kampot province. Purposive and snowball sampling was used to select five villages as study sites, and snowball sampling was used to select participants for FGDs and SSIs. Four SSIs and two FGDs were conducted in each village, giving a total of 20 SSIs and 10 FGDs. A further 20 SSIs at national and subnational levels were held with government officers, representatives of NGOs and civil society, and academics.

Data analysis

Data analysis involved two types of processing using different kinds of software. Before starting fieldwork, analysis was conducted to identify stakeholders, the formal relationships between them and, importantly, their decision-making powers. The first step was to identify all stakeholders through brainstorming and then classify them by their perspectives, involvement and interests. The next step entailed a mapping exercise to determine and visually illustrate the complex interactions between those stakeholders (Figure 2). This was done using Visualizer software. Mapping allowed researchers to identify which stakeholders would be useful to interview.

Audio recordings of the SSIs and FGDs were transcribed in Khmer, and the transcripts then translated into English. After being checked for consistency, the transcripts were sorted into three subfolders: interviews with community members, interviews with institutional actors and focus group discussions. The information collected was coded and grouped into clusters around particular themes that emerged through analysis. This exercise was done using Nvivo software.

Findings

The results revealed the socio-economic and environmental impacts of hydropower development in the immediate vicinity of Kamchay dam, especially on those who depend on natural resources for their livelihood. Vendors at Tuek Chhu resort and bamboo collectors, for example, reported being far worse off than they were before the dam.

Impacts on local communities and the environment

The dam has limited local people's access to natural resources. The densely forested Bokor National Park, previously state-owned land, is now privately owned by Sinohydro, and a large bamboo area has been permanently flooded by the reservoir. This means that collectors no longer have ready access to bamboo forest and need to go farther afield. Women from Ou Touch village stated, "Our livelihoods before the construction of the dam were better. Now that the bamboo area has been inundated, collecting is more difficult because we need to use a raft. Our livelihoods are harder than before the dam was built." Access to the bamboo forest was sometimes flooded, and there were regular reports of local people being denied access altogether.

Focus group discussions revealed that bamboo collectors' livelihoods have been cut by as much as 50 percent, and sometimes, when access to the forest was blocked, by up to 100 percent. Many people are landless or own a very small plot of land and therefore have to buy rice. Many have had to borrow money from microcredit institutions to buy

staple foods, and some have taken out loans to buy a boat so they can reach the bamboo area.

The incomes of fruit vendors at Tuek Chhu resort have fallen because fewer tourists have been visiting the area since the water level and flow declined, particularly in the dry season. There were even reports that some tourists had drowned when water was suddenly released from the reservoir; water is released irregularly and without warning. Women from Snam Prampir village explained, "We cannot sell as much as we used to because the water flow is too low for tourists to play in the river. Even on public holidays, the Chinese company does not release water. So fewer tourists have been coming here since the dam was built."

Local people expected to get free or low-price electricity but in fact the opposite has happened. Even worse, some villagers living near the dam have not been connected to the power grid. A man from Moat Peam village had "heard that people affected by the dam would get free electricity"; another villager, a woman, commented "No, we do not have electricity; they did not connect us to the power grid."

Environmental impacts were particularly apparent during the dam's construction, the most obvious being the flooding of 2230 ha of land and forest in Bokor National Park (SAWAC 2011). Water flow in areas downstream of the dam has been inadequate and irregular and, as many villagers especially fruit vendors complained, Tuek Chhu resort was attracting fewer visitors. A woman from Snam Prampir village told how she has "requested that the water gates be opened every day to allow water to flow constantly", adding "now we can sell only 20 to 40 percent of what we used to sell before the dam was built." There were mixed reports about impacts on fisheries resources, said to have increased in the upstream reaches but declined in downstream areas. A man from Bat Kbal Damrei village noted, "Before dam construction, each family could catch around 20 to 30 kg of fish. But now we cannot go fishing because the dam has blocked the river and fish cannot find the passages placed in the dam to help them move downstream."

Kamchay dam has also had some positive effects. Importantly, it has helped protect some areas from annual flooding. Life is better for those living in the previously flood-prone villages. A man from Bat Kbal Damrei village said, "My livelihood is better than before dam construction because there are no floods now." Even so, some villagers voiced safety concerns about the possibility of a flood disaster caused by the dam bursting or dam failure. No resettlement was required. Local people seemed satisfied with the compensation received for the loss of fruit trees and farms; some aired complaints, though with a degree of hesitation.

Flooding of the forest and resultant changes in biodiversity around the reservoir, lower river levels and highly irregular water flows in the dry season, and blocked passage of fish to downstream fisheries have had severe consequences. Bamboo collectors, fruit vendors and fishers have lost livelihoods to the dam, yet these groups of people were not considered for compensation payments.

Governance arrangements

Exchanges and interactions at all levels and between different levels of governance occur before and after dam construction. The decision to go ahead with Kamchay dam was made at the top level of government by the Council of Ministers and MME, with other government agencies designated as support agencies.

Study participants reported that local communities, particularly those most affected by the dam, were barely involved in pre-construction consultation processes. There was a public consultation as part of an environmental impact assessment (EIA). Although local authorities such as village chiefs and commune councillors were invited to participate in the EIA, most of the bamboo collectors were not asked for their views. People received very little information about the dam until construction started. Men from Tvi Khan Cheung village pointed out, "there were many complaints about the banning [of access to the bamboo forests affected by the dam]", and other villagers related how "up to 300 people protested on one occasion at being unable to access the bamboo areas." Some were dissatisfied with the low water levels at Tuek Chhu resort and would like the dam operators to release more water from the reservoir, and others complained about not having access to electricity.

It seems clear that conflicts have arisen since the operation of Kamchay dam. Many local people have lodged complaints with various local government offices and even Sinohydro, the dam developer. But it is not clear who is responsible for resolving

conflicts and addressing legitimate complaints, or how problems are resolved. Since pre-construction consultation in terms of process and representation was limited, it follows that communication between Sinohydro and governing authorities, and the people affected, is also likely to be limited.

Conclusion

The case study results, validated in recourse to an extensive cross-disciplinary literature review of the effects of large dams, highlight some positive and negative socio-economic and environmental impacts of Kamchay hydropower dam. The impacts seem to be distributed unequally. In particular, local people who depend on natural resources and ecosystem services for their livelihoods are worse off. The eligibility requirements for compensation benefits need to be tailored to include this group of people who have lost their livelihoods to the dam.

Environmental planning and management is generally absent, as is a monitoring and evaluation system. It is almost impossible for local people to have their complaints upheld because there has effectively been no defined coordinating mechanism for resolving the problems that have arisen during and since dam construction.

The extent to which people likely to be affected by a hydropower project should be informed and consulted is often disputed. There is no easy answer as it is difficult to assess the overall effects of a specific dam; the weighing of benefits and harms will always be contentious. Even so, the basic principles of good governance—transparent decision-making, local people properly informed and their concerns heard and addressed— should be applied.

This study demonstrates the broad applicability of political ecology research for analysing the complex power relationships underlying inequalities of access to natural resources—in this case, water, fisheries, bamboo groves and available energy. Data and information provided by such research will result in better decision making and greater long-term gains from natural resource management and hydropower development.

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