Livelihood impacts of hydropower projects on downstream communities in central Laos and mitigation measures

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ABSTRACT

We examine the social impacts of reservoir construction and management on communities located downstream from four hydropower projects in central Laos using the sustainable livelihoods framework to categorise and quantify impacts across environmental, financial, physical, human and social domains. Hydropower projects had profound impacts on the livelihoods of riparian households living downstream of the case study dams. Many were positive. Employment, social programs and infrastructure development were direct benefits. Indirect benefits included improvements in tourism and hospitality facilities as a consequence of hydropower project infrastructure such as access roads. For most case study households, these beneficial impacts outweighed adverse impacts on riverine fisheries. Minimising negative impacts and maximising the potential benefits requires that the construction, operation, and direct and indirect relations of the project operator with the communities meet appropriate standards of social responsibility. Policy implications of the research for hydropower policy in Laos, such as conditioning development, are discussed.

1. Hydropower as an economic development strategy

Despite an abundance of natural resources, Laos is classified as one of the least developed countries in South-East Asia with a low income per capita, weak human resources and a lack of economic diversification (UNDP 2007, 2013, 2015). The majority of the Laotian population lives in rural areas where subsistence agriculture and natural resources such as non-timber forest products remain the main sources of livelihood. About two thirds of Laotians live on less than USD 2 per day (UNDP 2007), and the country ranks 141 out of 178 countries according to the UNDP human development index (HDI = 0.575). Rural households have few livelihood options other than those based on traditional agriculture or natural resources. Another option is sending young family members to take unskilled jobs as casual construction labourers or garment manufacturing workers in urban centres.

In 2003, the Government of Laos (GoL) adopted the National Growth and Poverty Eradication Strategy (NGPES) that aimed to eradicate poverty through sustained and equitable economic growth (NGPES 2003). The strategy identified Laos' propitious niche as having favourable hydrological conditions, terrain suitable for construction of hydroelectric dams and accessibility to regional electricity markets, in particular China and Thailand. It thus singled out hydropower as the prime economic development pathway for Laos (Phomsoupha 2009; Pholsena and Phonekeo 2004). The GoL promotes hydropower as the means by which poverty can be eradicated, with the revenue from sale of electricity being used to further the country's social objectives (Phonsena and Phonekeo 2004; Phomsoupha 2009, 2010; Times 2013).

Based its geography and hydrology, Laos has the potential to build more than 100 hydroelectric dams on the Mekong and its tributaries with a combined generating capacity of 26,000 MW (Middleton et al., 2009; Sadettanh 2004). As of July 2016, Laos has 22
hydroelectric infrastructure (Richter et al., 2010). Of these, 400 million live in Asia (Bosshard 2010). Many rural communities in Laos have the projected potential with a total capacity of 3285 MW (DEB 2016). Export of electricity from hydropower projects in operation on the tributaries of the Mekong, nine of which are State owned with the remaining 13 having been constructed commercially or ignored in the project impact assessments (Phissamay 2010; NLPC 2007a; Osborne 2009). Thus impacts of hydropower projects also extend downstream where people’s livelihoods depend on the ecosystem services provided by the rivers and are consequently affected by modification of their flow regimes and other hydrological effects (Adams 2000; Allouche et al., 2014; Cernea 2004; Lawrence 2009). It is estimated that worldwide, about 470 million people have been negatively affected as a result of being downstream of large dams (Richter et al., 2010). This is about six to 12 times more than the estimated number of those directly displaced by hydropower projects (Richter et al., 2010). Of these, 400 million live in Asia (Bosshard 2010). Many rural communities in Laos live in the riparian zone of major rivers and their livelihoods are critically dependent on the ecosystem services provided by the rivers and surrounding forests (Bowden 1998; Shoemaker et al., 2001).

In 2001, the GoL mandated impact assessments as part of the approval process for hydropower project proposals (Phissamay 2010; Science, Technology and Environment Agency [STEA] 2000). Prior to building consent, an ex-ante social impact assessment (SIA) must be carried out by hydropower developers, either in conjunction with the environmental impact assessment (EIA) or as an additional process. Most projects identify the impacts and mitigation measures for the people who will be directly displaced by the project infrastructure (such as reservoirs). These people are typically resettled, have land allocated to them and receive monetary compensation (Nam Lik 1–2 Power Company Limited [NLPC] 2007a, 2007b; Nam Theun 2 Power Company [NTPC] 2004, 2005; Theun Hinboun Power Company [THPC] 2008, 2012; Zwahlen 2005a, 2005b, 2005c, 2005d). With the exception of one project, the Nam Theun 2 (NTPC 2008), impacts on downstream people are addressed superficially or ignored in the project impact assessments (Nam Lik 1 Power Company [NL1PC] 2009, 2010; NLPC 2007b). Apart from reports on the downstream effects of a single hydropower project (Brændeland and Hofsvang 1996; FIVAS 2007; Shoemaker 1998), there appears to have been no empirical research in Laos on the livelihood implications of hydropower development on downstream communities, and very few elsewhere in the world. We aimed to obtain some empirical data on the impacts of hydropower projects of varying age on communities immediately downstream of the infrastructure. Using the Sustainable Livelihoods Framework (SLF); DFID 2000, the object was to determine how the various capital assets of downstream communities had been affected by the dams and whether lessons could be learnt about how an deleterious impacts on these capitals could be mitigated through policy or other interventions.

3. Methods

To illustrate the types and extent of impacts likely to be experienced by local people, four villages located downstream from existing hydropower projects in central Laos were chosen as case studies namely Sengsavig (Nam Ngum 1), Namsanam (Theun Hinboun), Kengsavang & Mahaxai (Nam Then 2) and Naxeng (Nam Lik 1–2). To help understand changes in impacts over time, a ‘replicated cross sectional design’ (Kumar 2005) was adopted for the choice of case study villages with each of the four hydropower projects being at different operating stages ranging from recently operated to having been in operation for forty years (Table 1). The case studies were a good representation of the export-oriented large-scale hydropower projects in Laos Table 2. The sustainable livelihoods framework (SLF) was used to identify, categorise and quantify hydropower impacts. The SLF interprets sustainability from a rural livelihoods perspective and identifies five (natural, financial, human, physical and social) types of capital upon
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