

Environmental impact assessment: Theory, practice and its implications for the mekong hydropower debate

Lauren Campbell^{a*}, Diana Suhardiman^b, Mark Giordano^c, Peter McCornick^d

^a *Nicholas School of the Environment, Duke University*
Email: lauren.campbell@alumni.duke.edu

^b *International Water Management Institute*
Email: d.suhardiman@cgiar.org

^c *Edmund A. Walsh School of Foreign Service, Georgetown University*
Email: mg1382@georgetown.edu

^d *International Water Management Institute*
Email: p.mccornick@cgiar.org

Hydropower development in the Lower Mekong Basin is occurring at a rapid pace. With partial funding from international financial institutions has come pressure on the riparian governments to ensure that the potential environmental and social impacts of hydropower projects are properly considered. Environmental Impact Assessment (EIA) is one of the primary environmental management tools being proposed to fulfill these obligations. This article highlights some of the challenges that are inherent in applying EIA in the Mekong context through critical analysis of both its conceptual and institutional aspects. The main argument of the article is that while EIA application indicates a certain degree of environmental consideration, it is not necessarily sufficient to ensure good environmental practices. Lending institutions such as the World Bank have identified lack of implementation capacity as the biggest constraint to effective EIAs. Focusing on Laos, we show how EIA application should be equipped with necessary institutional arrangements and a transparent public participation process. This will ultimately require a shift within the region to allow environmental and social issues to be given significant weight.

Keywords: Environmental assessment, Hydropower development, Public participation, Mekong

1. Introduction

The Mekong River flows from China's Tibetan Plateau through Myanmar, Laos, Thailand, Cambodia and Vietnam before discharging into the South China Sea. The potential for hydropower is great and consequently, the Mekong and its tributaries have become the site of numerous hydropower dam projects. In recent decades, the number of these projects, some of which have reached implementation stages, has accelerated greatly in conjunction with the changing political dynamics of the region (Hirsch, 2010; Middleton,

* Corresponding author.

Garcia, & Foran, 2009). Laos, the least developed of the six riparian nations, has found the prospect of substantial income from the foreign funded hydropower projects to be vital for economic development (Lamberts, 2008).

Environmental Impact Assessment (EIA) has become one of the primary environmental management tools being used to assess the potential impacts of the hydropower projects and to certify that they are in compliance with environmental regulations. The production of an EIA has become a requirement for lending for many international financial institutions such as the World Bank and the Asian Development Bank (ADB) (Alshuwaikhat, 2005; Kersten, 2009; King, Bird, & Haas, 2007). Given this requirement, the riparian governments have been pressured to build capacity for EIA implementation.

The question arises as to whether EIA is serving its intended purpose in the Lower Mekong Basin (LMB), and more specifically Laos, or is instead applied with limited follow through once the basic funding requirements have been met. EIA standards in Laos are still being developed and are not always enforced, leading to documents of varying quality and accuracy. EIA implementation occurs at a single point in the planning process with no requirement for developers to revisit the EIA and consequently no realistic opportunity to adjust project design. In both the Mekong region and the rest of the world, there is concern that EIAs are being used not to assess potential environmental impacts, but rather to justify proposed projects and meet requirements for best practices (Alshuwaikhat, 2005).

The article begins with a brief summary of hydropower development in the LMB. It then starts with the rationale behind EIA and continues with a critical analysis of both the conceptual and institutional aspects of EIA. It highlights some of the inherent issues in EIA that limit its effectiveness. Currently, the way EIA is implemented in Laos with little public engagement results in serious limitations to monitoring and accountability of potential impacts once a dam is constructed. In order to serve its intended purpose of increased environmental protection and transparency, EIA needs to be accompanied by a meaningful public participation process and complementary institutional arrangements.

2. Mekong Hydropower Debate

The history of hydropower development in the Lower Mekong Basin started with the formation of the Mekong Committee (MC) in 1957 with the endorsement of the United Nations and the guidance of the United States (US) during the early part of the Cold War (Hirsch, 2010). The Committee was comprised of the government of Cambodia, Laos, South Vietnam, and Thailand. At this time, much of the Committee's work focused on planning dams for the mainstream of the Mekong that would create a series of lakes from northern Laos to central Cambodia (Hirsch, 2010). These plans came out of the Cold War ideology to pre-empt communism by improving economic development and enhancing the influence of the US and its allies. This was also a period where progress and large-scale infrastructure projects were thought to go hand in hand. None of the mainstream projects that were proposed during this period were ever constructed, mainly due to the conflict around the Second Indochina War. In 1975, Cambodia withdrew from the Committee,

putting development of the mainstream on hold. The Nam Ngum, built on a tributary in Laos, was the only hydropower project that was completed under the Committee.

By the end of the 1980s, there was renewed interest in hydropower development on the Mekong mainstream and in regional cooperation. Given that the mainstream flows through all of the riparian countries, impacts are likely to be transboundary (King et al., 2007). Thus, regional cooperation is vital in order to reduce the possibility of conflict between nations. Following the Rio Summit, the Mekong Committee evolved to become the Mekong River Commission (MRC) in 1995 when Cambodia, Laos, Thailand, and Vietnam signed the Agreement on Cooperation for Sustainable Development of the Mekong River Basin. The MRC has a formal mandate to cooperate in all fields of sustainable development, utilization, management, and conservation of water and related resources in the Mekong Region (Gajaseni, Heal, & Edwards-Jones, 2005; Mekong River Commission for Sustainable Development [MRC], 1995). Under this mandate, the Commission operates both at the regional and national levels.

Currently, the rapid speed of hydropower development in the LMB is linked to the growing demand for electricity in the region following rapid industrialization, export-led economic growth, and expanding domestic consumer markets (Middleton et al., 2009). The emerging importance of private sector financing also plays a vital role in accelerating the speed of the development. At present, there are approximately 120 hydropower projects in various stages of planning, design, and implementation, 12 of which are on the Mekong mainstream (Hirsch, 2010). The majority of these projects are in Laos. If constructed, the projects will enable the Lao government to export the bulk of the electricity produced to neighboring Thailand while also meeting national energy demands. The map produced by the Challenge Program on Water and Food (CPWF) shows that there are 238 completed dams and 93 dams planned and 30 under construction (including both hydropower dams with generating capacities larger than 15 megawatts and irrigation dams with reservoir areas larger than 0.5 square kilometers) in the LMB.

Rapid hydropower development in the region has been met with resistance as the environmental and social impacts of dams have become increasingly important public issues over the past decade. The Mekong river system is home to one of the largest freshwater fisheries in the world and provides water for agriculture that supports both local rural populations (Hortle, 2007; Keskinen, 2008a) and a range of interconnected ecosystems (Kisten & McCormick, 2009). The projects are likely to have major impacts on the availability of these water related resources and consequently on the livelihoods of millions of people (Arthur & Friend, 2011; Baran & Myschowoda, 2009; Dugan et al., 2010; Hortle, 2009; Keskinen, 2008a).

With World Bank and ADB funding, EIA has become one of the primary environmental management tools being used to assess the potential impacts of the hydropower projects. Consequently, there has been a push among riparian governments to build capacity for EIA implementation¹ (Alshuwaikhat, 2005; Kersten, 2009; King et al., 2007).

¹Since 2006, the EXIM banks which are not strictly private sector but also quasi government and tools of government policy together with the private sector have been playing an increasingly important role in funding hydropower projects, sidelining World Bank and ADB financial involvement.

In Laos, the Department of Environmental and Social Impact Assessment (DESIA) was created within the Ministry of Natural Resources and Environment in 2008 (at that time still under Water Resource and Environment Administration or WREA) for the purpose of reviewing EIAs and SIAs (Social Impact Assessments).

3. History and critical analysis of EIA

This section describes the general history of EIA and discusses its conceptual weaknesses. These include a high potential for bias in the assessment process, its characteristic as a procedural tool, and the importance of public participation in the overall shaping of outcomes. Here we examine each of these issues in general, with special reference to developing country contexts, before turning to their implications for Laos specifically.

3.1. History and rationale behind EIA

The EIA process originated with the passing of the US National Environmental Policy Act (NEPA) in 1970. From there, EIA spread rapidly across the globe and is now practiced in more than 100 countries and has been used by numerous international funding agencies as their main indicator for environmental safeguards (Cashmore, Gwilliam, Morgan, Cobb, & Bond, 2004). In 1989, the World Bank introduced a comprehensive environmental assessment policy requiring an EIA to be undertaken for major projects by the borrowing countries with World Bank supervision (Alshuwaikhat, 2005; World Bank, 2007). The United Nations Environment Programme (UNEP) has offered guidance on EIA procedures to member states and specifically to developing countries (Alshuwaikhat, 2005). The ADB's environmental policy also recognizes the need to incorporate environmental considerations into national and sub-national development planning (King et al., 2007). In Laos, EIAs have been introduced and applied since the mid-1990s under the auspices of the Science Technology and Environmental Agency (STEA). With the formation of the WREA in 2007 and the promulgation of the EIA decree in 2010, the government formally included preparation of an EIA as one of the requirements of hydropower development.

The International Association for Impact Assessment defines EIA as the process of identifying, predicting, evaluating, and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made (International Association for Impact Assessment [IAIA], 1999; Keskinen & Kummu, 2010). EIA is separate but related to the two other methods of impact assessment: Strategic Environmental Assessment (SEA) and Cumulative Impact Assessment (CIA). SEA evaluates the environmental impact of policies, plans, and programs and is applied at an earlier, strategic stage in the planning process (Alshuwaikhat, 2005; Keskinen & Kummu, 2010). CIA examines the impact of multiple projects on individual environmental receptors in a specified geographic area over a certain time period (Keskinen & Kummu, 2010). EIAs take the form of a written report and the process is applied at the project-level. EIAs are intended to inform decision makers on the potential environmental impacts of a

proposed project (Salzman & Thompson Jr., 2007) and are typically not meant to halt development or reverse the consent decision on a project. Theoretically they should present information from an unbiased viewpoint and should allow those who are affected by the project to have representation in the process (Karjalainen & Jarvikoski, 2010). Public involvement puts pressure on the agency to select the least harmful project option and to effectively curb impacts. However, the EIA process does not require the decision maker to select the most environmentally sound option as long as the agency complies with the EIA procedure and prepares a comprehensive EIA (Kersten, 2009; Salzman & Thompson Jr., 2007).

Focusing on the actual application of EIA in Laos, this article brings to light the conceptual weaknesses as well as the challenging legal and political environment for such assessment to gain significance, especially when the necessary institutional arrangements and transparent public participation process are lacking. It argues that these conceptual weaknesses and challenges are not inherent to EIA alone, but could also be found in SEA and CIA application in the region. For example, while the Initiative for Sustainable Hydropower of the MRC has conducted an SEA in the Lower Mekong Basin, it is unclear how the assessment could be incorporated in hydropower decision-making at the regional level. Similarly, while the Basin Development Plan of the MRC has initiated the development of CIAs for multiple hydropower projects, it remains unclear whether the assessments can provide any ground for discussion among hydropower project developers towards more sustainable hydropower.

3.2. Ambiguity, defined scope, and method of assessment

EIA has conceptual weaknesses at its core that may impact its adequacy. These include its ambiguity, defined scope, and method of assessment. First, EIA is a report that outlines predicted impacts of a proposed project based on the best available data. Scientific uncertainty is an unavoidable part of the decision making process as the described impacts are hypothetical (Salzman & Thompson Jr., 2007). Thus, it is important for adequate baseline data to be collected and for monitoring to be conducted once project implementation begins. In the US, under NEPA, it is required that the agency make “reasonable efforts” to gather adequate data (Salzman & Thompson Jr., 2007). Similar requirements exist under other EIA statutes. If baseline data is not accurate or extensive enough, the predicted impacts may be substantially different from the actual ones, reducing the document’s applicability.

Second, EIAs can also be weak if either the defined scope, or impact area, that is analyzed is too small or large to adequately assess all of the project’s impacts. The scope of a project is defined early on in the EIA process. Care must be taken to ensure that the scope is broad enough to cover all potential impacts and narrow enough to expose detailed impacts. This is of particular importance when assessing hydropower projects as the downstream impacts to fisheries can extend to communities hundreds of kilometers away from a dam (Richter et al., 2010). In addition to a defined scope in area and distance, it is also important for the EIA to have a defined length of time, as short and long-term impacts may vary (Keskinen, 2008b).

Further, given that the EIA format assesses resource areas individually, problems can arise when integrative processes that affect multiple resource areas are impacted. For example, the Tonle Sap flood pulse in Cambodia is at risk of being impacted by hydro-power development. The Tonle Sap is governed by the variations in the Mekong's flow throughout the year (Lamberts, 2008). When water levels rise above a threshold level, usually late May or early June, flow in the Tonle Sap is reversed and river water is pushed into the Tonle River and Lake. Characteristics of the flood pulse have important ecological significance. Upstream development outside of Cambodia may alter ecological functions and characteristics of the flood pulse and consequently fisheries production (Lamberts, 2008). Yet, Lamberts (2008) argues that given EIA's discrete method of assessment, direct impacts to a given resource may be found to be limited, while the cumulative damage to the Tonle Sap may be severe. Most EIAs require a cumulative analysis that has the potential to cover integrative processes. However, cumulative analysis requires a significant amount of baseline information and in developing countries this information is often not available or not shared between countries.

Assessment problems can also surface when there are other ongoing or planned projects in proximity to a proposed project being assessed. Nearby projects can magnify impacts or lead to complex interactions. Thus, it is important for information regarding concurrent projects to be included in the cumulative analysis section of an EIA. For example, the EIA of a single hydropower dam project may conclude that the environmental impacts will be less than significant. If an additional dam is being built concurrently on the same river, which is the case in both the main stem and tributaries of the Mekong, the combined impacts of the two projects may become significant. Therefore, in order for an EIA to accurately predict impacts, it must take surrounding projects into consideration. This can be difficult to accomplish in countries where project information is not publicly available or robust. Cumulative impacts are of particular concern in the Lower Mekong given the sudden revival of many hydropower projects at the same time on one river (International Centre for Environmental Management [ICEM], 2010). In Laos, EIAs are typically conducted at the project-level without a detailed review of cumulative impacts.

3.3. EIA framework and process

As described above, EIAs are organized under a rigid framework, with each resource area assessed individually. Though they vary in their scope and depth of analysis, they all contain the same basic elements. An EIA should: address a range of environmental issues by resource area (e.g. water, air, ecosystems) and an analysis of cumulative impacts; contain an appraisal of the no-project situation as well as alternatives to the proposed project; contain both qualitative and quantitative assessments of predicted impacts; and state mitigation measures that could be taken to reduce the scale of negative environmental impacts (Merrett, 1997). The analysis of alternatives in an EIA is of particular importance as it compares different project options based on environmental impacts and allows the decision maker to select a project that both meets objectives and has a lesser environmental impact (Salzman & Thompson Jr., 2007).

EIAs are typically written by a hired consultant and reviewed by both the decision maker and the responsible government agency. Conceptually, EIAs are meant to be an unbiased source of information presented by an impartial or neutral viewpoint (Karjalainen, 2010). Problematically, it is universal practice for the consultant to be hired by the project developer, which introduces a source of bias into the EIA process. Both the lead agency and the consultant want the project to be approved so there is a strong incentive to ignore or downplay negative impacts and to exaggerate potential benefits (O'Faircheallaigh, 2010). The developer has the opportunity to review the EIA before it is made public and can therefore express his or her opinion regarding the description of impacts. In most cases, the consultant has an incentive to appease the developer in order to ensure that the consultant is hired to write EIAs for future projects (McCully, 2001). As a result, many EIAs for international dam projects conclude that the dam's environmental impacts can be accurately predicted, will be relatively minor, and can be cheaply and easily mitigated (McCully, 2001).

This source of bias can negatively affect EIAs, as there is a tendency to downplay potential socio-environmental impacts as well as in misinterpreting or overestimating the potential effect of the proposed mitigation measures. For example, the 2010 EIA for the proposed Xayaburi hydropower project on the Mekong mainstream analyzed potential impacts to fisheries and recommends that fish ladders be used to mitigate these impacts (TEAM Consulting, 2010). However, relying on earlier studies conducted by its Fisheries Programme (Ferguson, Healy, Dugan, & Barlow, 2011; Hortle, 2009), the MRC's 2010 Strategic Environmental Assessment (SEA) states that fish ladders are not a realistic mitigation option for Mekong mainstream dams in part due to the large variety of fish present in the basin (Hortle, 2009; ICEM, 2010). The severity of impacts to fisheries has continued to be a source of disagreement between environmental groups and developers. Friend (2009) explains that Lower Mekong governments and private developers have viewed impacts to fisheries as an unavoidable, but necessary cost of hydropower development. Published data on fisheries has improved (Baran, 2006; Baran & Myschowoda, 2009; Ferguson et al., 2011; Halls & Kshatriya, 2009; Hortle, 2009), however impacts continue to be downplayed in subsequent project-level EIAs.

3.4. *EIA: A procedural tool*

The issue of potential conflict of interest that emerges from the way EIA is framed brings to light the need to look at the EIA process. The EIA process is as important as the contents of the document itself. The process begins with initial examination of the project to determine if an EIA is needed, typically based on regional standards. If it is, the project description is made publicly available and feedback from the public is solicited. The project description should highlight resource areas of concern. Following scoping, the Draft EIA is written based on accepted regional and/or international guidelines. As described above, the analysis is divided by resource area including an analysis of alternatives to the proposed project and cumulative impacts.

Once complete, the Draft EIA is published for review by stakeholders, the reviewing agency and the public and any comments are documented. Following the review, the

Draft EIA is revised based on comments received and any new information available to produce the Final EIA. The Final EIA should also include a monitoring plan for mitigation measures and highlight which impacts were found to be significant. The Final EIA is sent to the reviewing agency, which makes the ultimate decision on whether to approve the project or not. Once project construction begins, it is expected that the mitigation measures will be implemented and construction monitoring will take place. However, impacts and mitigation measures are not always carried out as intended. Monitoring is typically required to ensure that project activities are going as planned and to determine whether corrective action is needed; however even that may not be enough to curb environmental impacts effectively. Many impacts cannot be mitigated once the project is built (McCully, 2001), reinforcing the point that the EIA itself needs to be as accurate as possible for it to be effective.

Timing is another important aspect of the EIA process. As EIAs are intended to inform decision makers of the potential environmental impacts of a proposed project, they should be made available before the project moves forward or any meaningful action is taken. Otherwise the EIA serves as a post hoc rationalization for a decision that has already been made (Salzman & Thompson Jr., 2007). In the US under NEPA, there are standards for the minimum number of days for comment and review periods. This facilitates accountability of lead agencies by giving the public the information and time needed to review a project (Kersten, 2009).

In summary, the significance of the EIA is shaped primarily by the relevant government agencies' interests and ability to mitigate the assessed impacts. If the EIA is produced, but there is no repercussion for the agency or the operator for failing to implement mitigation measures, then a major part of EIA's governance value is lost. As described above, the agency is not required to select the least harmful project. The role of the EIA is to give the agency the ability to make an informed decision. This aspect of EIA is sometimes a point of contention in the Lower Mekong where environmental groups often argue that the agency is required to choose the least harmful project.²

3.5. EIA and public participation

The World Commission on Dams (WCD) defines two forms of public participation: the one-way conveyance of information to the public or the inclusion of public views into the decision making process (Sadler, Verocai, & Vanclay, 2000). As mentioned above, a fair and properly implemented EIA allows those affected by the proposed project to have a voice in the process, favoring the later form of public participation (Karjalainen & Jarvikoski, 2010). The EIA process provides specific opportunities for the public to review

²Such discussion occurred with regard to the Thakho and Don Sahong dams, both planned for construction in the Mekong mainstream. It was generally argued that the Thakho dam would have less harmful impacts on fish migration compared to the Don Sahong dam due to its location. However, amidst the current push to continue with construction of the Don Sahong dam, the Thakho dam as an alternative 'disappeared' from the discussion, implying political influence in EIA processes.

the project, such as during the initial scoping process and review of the Draft EIA. Public participation can serve to give an EIA greater legitimacy and transparency and make it more comprehensive. As public and stakeholder comments are recorded and individually addressed in the Final EIA, their comments may be able to carry weight in the process. Furthermore, as EIAs cannot be entirely comprehensive given their format, the public participation aspect allows the public to be able to fill in gaps in information. For example, the consultant writing the EIA may not fully comprehend the impact that a change in land use induced by a project may have on a local community. Public participation allows local members of society to point out if the EIA is incorrectly identifying the existing land use of a parcel or which natural resources are sensitive in the project area. Furthermore, even if there is not strong public mobilization, the knowledge that an EIA will be subject to public scrutiny may be enough to cause the lead agency to produce a satisfactory EIA (Kersten, 2009).

Public involvement can be beneficial to stakeholders and members of the public as well as the lead agency. Stakeholders can include people directly affected by a project, government officials, the broader national community, NGOs, and other interest groups (Nam Theun 2 Power Company [NT2PC], 2005). Members of the public benefit by being made aware of project impacts and being given the opportunity to voice their opinions. Though the intent of EIA is not to stop a project, the procedural nature of the EIA process gives the public the opportunity to stall a project and potentially take legal action. Research has also found that EIAs lead to increased environmental awareness, particularly in relation to public understanding of local environments (Cashmore, Bond, & Cobb, 2007).

The lead agency can benefit from public participation as it can make project implementation smoother by lowering the risk of protest or dissatisfaction (O'Faircheallaigh, 2010). Major development projects can be sources of conflict and if the public feels that their concerns are being taken into account, they may be less likely to attempt to stall the project. Also, public review of an EIA can help legitimize the document by indicating that the public finds its analysis adequate. Furthermore, the knowledge that an EIA will be subject to public scrutiny may put pressure on the lead agency to make the project as environmentally sound as possible.

However, when public participation is not included in the EIA process, not implemented adequately, or used mainly within the framework of cost-benefit analysis in a rather strict monetary form (Mirumachi & Torriti, 2012), it can discount the full social and environmental cost, and thus negatively affect those impacted by a project. The powerless in society are the least likely to participate in the EIA process both because they lack the resources to do so and because the process is alien and intimidating to them (O'Faircheallaigh, 2010). As EIAs contain technical and scientific information, they are more accessible to educated sectors of society (Cashmore et al., 2007). Therefore, if the lead agency does not take measures to ensure that all levels of society are included, it is unlikely they will be. EIAs can also make marginalized groups more marginalized. O'Faircheallaigh (2010) describes a case where Indonesian officials undertook an EIA as a requirement for international funding but continued to ignore the interests of villagers

whose land was being lost to agribusiness projects. In such a situation, the lead agency is able to fulfill funding requirements and further justify the project without being forced to seriously address local interests.

4. Research Methodology

The line of analysis and arguments presented in this article are derived from in-depth case study research (Burawoy, 1991; Yin, 1994), conducted by the first and second authors from July 2010 to December 2011 in Laos. This case study research is part of a larger research effort on hydropower decision-making in the Lower Mekong Basin conducted by the second author from May 2010 to June 2012 in Laos, Cambodia, and Vietnam (Suhardiman et al., 2014; Suhardiman et al., 2015). While the first research effort focuses on how key stakeholders perceive the current positioning of Environmental Impact Assessment within the overall context of hydropower decision making in Laos, the larger effort looks at hydropower decision-making structure and processes, and how these shape the power interplay in Mekong hydropower development.

In both research efforts we used the general concept of grounded theory (Strauss & Corbin, 1990) as our research methodology. Highlighting the link between theory and practice, and thus the development of theory as a process, we focused on the development of complex relations and actual practices that shape and reshape policy formulation and implementation in hydropower development.

This article examines in particular EIA implementation in Laos, how it is shaped and reshaped by various stakeholders (e.g. international donors, different government agencies, private companies, civil society groups), the rationale it is based on, and its implications for the Mekong hydropower debates.

To understand the current positioning of EIA within the overall context of hydropower decision-making in Laos, we reviewed existing policies and legal frameworks in land, water, and environment, as related to hydropower development. We reviewed the guideline on EIA review³ (2011) in relation to other relevant policies and legal frameworks such as: 1) National Policy on Sustainable Hydropower (2009); 2) Government Decree number 192 on Resettlement, Compensation and Grievance Procedure for Project Affected People (2006); and 3) draft National Water Resources Policy (2010). The specific policies and legal frameworks reviewed are given as appendix 1. More detailed information and explanation can be found in Suhardiman et al., (2012).

To understand how various stakeholders (government agencies, international donors, civil society organizations) view and perceive EIA in relation to their formal roles and mandates in hydropower development, we used institutional analysis to map the national-level (sectoral) decision-making landscape in Laos (Aligica, 2006), which included organizational

³The guideline on EIA review is formulated through funding from the Swedish International Development Agency (SIDA) and Danish International Development Agency (DANIDA) with close collaboration with MoNRE.

analysis of relevant government agencies and other key actors in hydropower sector development in Laos. In total, we interviewed 38 government officials: four from the Ministry of Planning and Investment (MPI) as the agency with direct links to private developers, 10 from the Ministry of Energy and Mines (MEM) as the agency in charge of hydropower development, 14 from the Ministry of Natural Resources and Environment (MoNRE) as the agency assigned to review the EIA of each hydropower project, three from the National Land Management Authority (NLMA) as the agency responsible for national land use planning and land concessions for hydropower development, and seven from the Ministry of Agriculture and Forestry (MAF) as the agency responsible for agriculture, forest protection, and rural development. In addition, we interviewed 11 staff from various donor agencies, including the World Bank, Asian Development Bank, Australian Aid (AusAid), Danish International Development Agency (DANIDA), Swedish International Development Agency (SIDA), European Union, Swiss Development Cooperation (SDC), and the Government of Finland. To develop an overview of how EIA is perceived by the wider society, we also interviewed representatives from 15 civil society groups (e.g. IUCN, WWF, Helvetas, CIDSE, Village Focus International) working in Laos.

To understand the actual shaping of EIA implementation and the role of private sector actors at the project level, we reviewed existing procedures for hydropower project design, construction, and operation and interviewed 14 staff from the key hydropower companies in the country. We also reviewed a range of related EIA (15), Resettlement Action Plans (RAP) (5), and multiple other project documents (e.g. feasibility studies report, monitoring and evaluation report).

We compiled information and insights gathered from each interview in the form of interview reports. These reports were systematized according to defined interview questions (e.g. current policy standing of EIA in hydropower development decision making, stakeholders' views and perceptions on EIA's potential and actual role, and how private sector actors shape EIA implementation at the project level), respondents' professional backgrounds, organizational affiliations, and date of the interview. Each report was codified manually using a method similar to Nvivo (QSR International, 2008).

5. EIA implementation in Laos

5.1. EIA as donor-funded environmental management exercise

EIA was first introduced in Laos in the 1990s by the Government of Sweden through the Swedish International Development Agency (SIDA) funded project Strengthening Environmental Management (SEM). The project's main objective was to build capacity within the relevant government agencies for the overall shaping of environmental management strategies and for EIA formulation and review in particular. At that time, the project was placed within the Science Technology and Environment Agency (STEA) which became the Water Resources and Environment Administration (WREA) in 2007 and upgraded into the Ministry of Natural Resources and Environment (MoNRE) in 2010.

Currently, SEM III (2010–2012) is operating with the funds provided by the Government of Finland following the completion of SEM I (2000–2005) and SEM II (2005–2010).

The incorporation of EIA review guidelines into national policies and legal framework as well as the formation of DESIA as the government agency in charge of EIA review and approval is in principle commendable, highlighting the government's recognition of the importance of social and environmental safeguards in hydropower development. In practice, however, our interviews with staff from DESIA, other ministries, private sector actors, and international donors reveal that DESIA still lacks the technical knowledge to critically review EIAs and the capacity to monitor the proposed measures to minimize the impacts.

DESIA's lack of technical knowledge to critically review EIAs is most evident in the way sub-standards EIAs were often approved, without further inquiry with regard to more thorough and comprehensive reports on potential socio-environmental impacts and additional measures that need to be taken to minimize such impacts. From our interviews with DESIA staff, other ministries staff, and international donors, we learned that EIA formulation relies primarily on the knowledge of private developers and/or consultants assigned to write the EIA about the proposed development projects. In the absence of technical knowledge, EIAs are formulated rather generally, not covering the necessary scope or impact area to adequately assess all of a potential project's impacts. For instance, our interviews with one technical advisor revealed that it is not uncommon to find very general and highly similar, if not almost identical, EIA reports for two different development projects (i.e. for mining and road construction) prepared by the same consultant. Or, as stated by an international project staff who worked on a capacity building program funded by the Government of Finland at MoNRE: *"I discovered that the EIA for two different roads in two different provinces (not neighboring to each other) are written exactly in the same way, using the same wording"* (interview with EIA technical advisor, August, 2010).

Our interviews also revealed that DESIA staff relied mainly on an externally hired, mostly project funded technical advisor to review and approve the EIA for each project. Formally, while the technical advisor could advise on the EIA review and approval, s/he is not assigned with the task to review all EIAs. While some might think that this heavy reliance on an external technical advisor could partially help DESIA to approve only sound EIAs, such reliance may also severely undermined DESIA's organizational ability to critically review EIAs, especially if the technical advisor leaves upon project completion.

DESIA has hardly sufficient staff to ensure that EIA review is of the highest standards and that monitoring of proposed measures is done on a regular basis. In 2011, DESIA was comprised mainly of less than 10 junior staff who had recently finished their university education and lacked work experience. In an attempt to address this capacity problem, international donors have supported the organizational development of DESIA through funding support and capacity building programs. More recently, while DESIA staffing at the national level has been considerably strengthened (in terms of number of staff, office equipment, and senior staff recruitment), it still has very low presence at the provincial and district levels. MoNRE has technical representatives at the provincial and district levels,

but these staffers are responsible for MoNRE's overall work and are not specifically focused on DESIA's role to regularly monitor impacts from various development projects.

Consequently, sub-standard EIAs are often followed by a lack of effort to enforce defined mitigation measures as well as the absence of proper updates and monitoring of impacts to ensure that mitigation measures are effective. The World Bank has identified this so-called 'lack of implementation capacity' as the biggest constraint to effective EIAs (Alshuwaikhat, 2005). The same author (2005) notes that in many Asian countries, EIA has been introduced with insufficient staffing, experience and monitoring and with inadequate evaluation and baseline data.

EIA's application in Laos resembles merely a donor-funded environmental management exercise. The characteristic of EIA implementation as a donor-funded environmental management exercise was most apparent in the EIA formulation process for the Nam Theun 2 (NT2) hydropower project. Based on both the World Bank's and ADB's intention to use the NT2 project as their 'best practice' hydropower project, the EIA review process took almost 10 years. Completed in 2005, the Final EIA includes a detailed assessment of project alternatives, social and environmental impacts, and the public consultation process. It has been considered the most comprehensive and accurate EIA produced in Laos to date. Nevertheless, the Lao government has said that it would not go through with an assessment process as long and comprehensive as NT2's in the future (Hirsch, 2010). Given the high level of detail in the NT2 case, it may be possible for the assessment process to be scaled back without severely reducing an EIA's validity. However, the larger concern is that the NT2 case has led the Lao government and its development partners to seek funding from the private and quasi government banking sector, rather than the development banks (Keskinen, Kumm, Kakonen, & Varis, 2012).

5.2. *A rubber stamp to speed up investment*

Lack of capacity both in terms of lack of technical expertise for the case of EIA review and lack of personnel in the case of monitoring and enforcement is certainly an issue. Nonetheless, we argue that the lack of capacity is merely a symptom of a much greater problem rooted in the political importance of hydropower development in the country. Or, as stated by an international EIA consultant:

"Despite 10 years of capacity building effort, the actual capacity of MoNRE/DESIA staff to review EIA remains poor. Perhaps, this is because government officials are not really interested in EIA, as environmental issue is not something that falls in the interest zone of the country" (September, 2010).

From our interviews with relevant stakeholders we learned that the problem of continuous approval of sub-standard EIAs is rooted in the fact that government officials are not interested in EIA, because environmental issues do not carry significant weight in the existing political landscapes. The government's development objectives of promoting economic growth in order to upgrade the country's status from the Least Developed Countries in 2015 and positioning hydropower development as one of its main sources of revenue

(as defined in the seventh National Socio-Economic Development Plan 2011-2015) facilitate rapid hydropower development and indirectly encourage relevant ministries to approve investment projects proposed by private developers (as a means to ensure economic growth). This to a certain extent limits MoNRE's or DESIA's governing space to use its role in EIA review and approval as an entry point for increased environmental considerations in proposed development projects.

EIA is largely a procedural tool used in the decision-making process and in order for it to be effective, it necessitates proper institutional arrangements for its implementation. EIA implementation must follow specific guidelines, as explained above, and ultimately only requires the decision maker to consider alternatives to the project. The process does not require that the least harmful project be selected. Given this procedural nature, in developed countries there is heavy reliance on institutions such as the White House Council on Environmental Quality in the US, to ensure that the process is followed correctly and mitigation measures are implemented. If such as institution is not present or has insufficient political power, then a developer may be able to produce a substandard EIA without being reprimanded.

Our interviews with officials from DESIA and other government ministries such as the Ministry of Planning and Investment (MPI) and the Ministry of Energy and Mines (MEM) reveal how DESIA's role of reviewing EIAs for hydropower projects is hampered by, for instance, the MPI's interest to accelerate targeted national economic growth as well as MEM's interest to achieve its sectoral development targets. As stated by a staff from MoNRE:

"In theory, MoNRE could reject sub-standards EIAs to ensure quality control and the application of socio-environmental safeguards. In practice, however, MoNRE would have to approve EIAs for hydropower projects as to not delay projects implementation, the flow of investment to the Ministry of Planning and Investment (MPI), and the overall revenue generation. MPI needs to ensure that investment flows from private sector actors are sufficient to achieve the government's target on economic growth" (interview with MoNRE official, March 2011).

In practice, MPI may push for EIA approval to speed up investment flows as this is in line with the government's strategy to create a conducive environment for foreign investors as stated in the Seventh National Socio-Economic Development Plan 2011–2015, thus sidelining the DESIA's decision-making authority in EIA review. This results in a tendency for EIA application to downplay potential socio-environmental impacts and/or overestimate the potential effect of the proposed mitigation measures.

Related to this lack of power, our interviews with DESIA staff and officials from MoNRE also indicate that the problem of approving sub-standard EIAs is closely linked with the way project developers and government officials—in particular those from the Ministry of Planning and Investment (MPI) and the Ministry of Energy and Mines (MEM)—view EIA merely as a procedural requirement for project approval. Project developers and government officials perceive EIA as merely a single step requirement for funding approval (if the project is funded by IFIs such as the World Bank and the ADB)

or for the overall project approval (if the project is privately financed). Typically developers assign the task of EIA formulation to national consultants who are well connected to DESIA staff in order to ensure that the EIA review proceeds smoothly. Here, the main objective is to get immediate approval and begin with the planned development project as soon as possible.

5.3. *Private developers as ad-hoc decision makers*

Public involvement is severely lacking in the overall application of EIA in Laos. Contradictory to the objective of increased transparency and accountability in development projects, civil society is constrained and project affected communities have little voice in project design and operation (Hirsch, 2006; Johnston, 2008). Consequently, there is low public engagement in the EIA process, furthering the question of EIA's role in the region. Even though international NGOs have been pushing for greater public involvement, public participation has remained limited.

Involvement from project-affected people in the overall shaping of EIAs has taken place only through their interactions with project developers. Here, the degree and the quality of involvement of the project-affected people is determined mainly by how the developers view the role of EIAs as an integral part of their company's 'modus operandi' or as merely a single step required in hydropower development processes (Mirumachi & Torriti, 2012; Sayatham & Suhardiman, 2015). In the case of the NT2, the developers spent considerable efforts and resources to ensure public participation in the overall shaping of the EIA. Yet, lacking any important motive/incentive to incorporate EIA as part of the company's operational rule, many developers have the tendency to cut efforts and funds for public consultations. Therefore, it is not uncommon for actual negotiation on resettlement and mitigation plans to take place between private developers, provincial/district governments, and project affected people only during the early stage of dam construction, with very little or no connection to the defined mitigation plan stated in the EIAs.

In Laos, DESIA formally invites the relevant sector ministries to review the EIAs. Theoretically, this meeting provides the opportunity for DESIA and other ministries to discuss their opinions of potential project impacts. In practice, however, from our interviews with DESIA staff as well as staff from other relevant ministries, we learned that meeting attendees seem to have the common objective of getting the EIA approved as soon as possible in order to continue with the proposed development projects. This meeting is often the only major review of the EIA. Even when the public is consulted on a project, it is typically in the form of conveyance of information without giving weight to any public feedback received. In general, the EIAs are often not made public, even after they are complete or project implementation begins.

In Laos, EIAs are focused on assessing potential impacts from a specific development project, regardless of whether the project will affect other planned/ongoing projects or be affected by them. In its Seventh National Socio-Economic Development Plan (2011–2015),

the Government of Laos (GoL) stated that its goal of achieving rapid economic growth relies on the industry, agriculture, forestry and services sectors, all major sources of revenue generation (Government of Lao PDR, 2011). Yet, the plan did not mention the role of cross-sectoral planning as an integral part of the government's objective to achieve the targeted economic growth.

Recently, hydropower development planning has been limited to identification of potential sites and additional evaluation of selected sites and conducted annually by the Department of Electricity (DoE) (now Department of Energy Policy and Planning or DEPP) within the MEM. A robust and reliable power system development plan is lacking. Formally, Electricité du Laos (EdL) and MEM are responsible for the formulation of the country's power system plan. In practice, both agencies depend on private investors to direct the country's hydropower development. Given their lack of financial means, they could hardly control the plan's progress both in terms of timing and site selection. As expressed by an official from MEM:

"Sometimes, the government wants to develop hydropower project on site A, but cannot do this because money is not available. At the same time, private investors are interested to develop a project on site B. The government will accommodate this because private investors have the money ready and they can then proceed with the development almost immediately" (interview with official from MEM, October 2010).

Thus, while development targets in the energy sector are focused on implementation of hydropower projects (through construction and completion of important energy infrastructure such as dams and transmission lines) for revenue collection from the generated/exported electricity, these projects are not designed, reviewed, and implemented as part of the country's overall power system plan.⁴ Rather, they are handled separately through project developers' relations and interactions with both EdL and the MEM.

6. Implications

It is worth questioning why EIAs in Laos remain inadequate in terms of both analysis of impacts and proper execution of EIA procedure. EIAs were introduced to the Lower Mekong region over 10 years ago, a reasonable amount of time for capacity improvements. If EIAs are being used to justify proposed projects without a clear perception of EIA or significant public involvement in the process, then it is unlikely that they will be effective in fulfilling their original purpose of environmental impact assessment and stakeholder engagement. It is also unlikely that the process will improve environmental management, as implementation problems may be a symptom of lack of interest in EIA rather than insufficient capacity (Käkönen & Hirsch, 2009).

⁴ It is important to note here that a developer will propose a different site mainly because that is the site for which they have an MoU with the MPI. MPI's issuance of MOUs in this way without consultation with relevant sector ministries (MEM in this case) has created considerable inconsistency between project planning and actual implementation.

EIA is a western tool intended to be applied in a society that is open to public involvement and demands freedom of information. Kersten (2009) questions whether NEPA and its components can be brought to other countries without the western institutions that support it. Though international EIA regimes may be beneficial to the environment, their effectiveness may be curtailed by a lack of analogous institutional arrangements or differing regional values. If EIA is applied in a socio-political environment that is not suited to EIA procedures, it may fall flat without realizing any major environmental or societal benefit.

This is not to say that EIAs are completely ineffective in developing countries, but rather that the existence of an EIA should not be taken as complete proof of sound environmental practices. Current EIA processes can do a disservice to water resource management by leading decision makers to believe that they are adequately informed (Lamberts, 2008). Insufficient EIAs can also enable project developers to fulfill environmental requirements without adequately addressing the full array of impacts on the ground. This is particularly a problem for the hydropower dam projects that have significant and widespread impacts, such as those on the Mekong mainstream and major tributaries. The implementation of a tool that fails to fulfill its purpose of informing stakeholders and assessing and mitigating project impacts does little to benefit the environment. Yet, by enabling the project to move forward, the EIA gives validation, leaving less room for criticism and debate.

7. Conclusion

EIAs are environmental management tools developed to allow government agencies to make informed decisions, lessen the environmental impacts of a given project, and increase project transparency through public involvement. As a tool, EIA application and its actual significance depend on how relevant agencies perceive its usefulness above and beyond a politically-sanctioned funding requirement, and thus how they apply it in accordance to their views and interests in hydropower development. EIA application in the Lower Mekong Basin indicates a certain level of environmental concern with regards to natural resources management in the region. This indication, however, should not be seen as a guarantor of good environmental practices. Our Mekong case highlights how EIA's application could downplay potential negative impacts of hydropower projects. This highlights the important role of participation from both potentially affected people and wider communities in order to increase the quality and accountability of the assessment (Käkönen & Hirsch, 2009). If the assessments are intended to have actual significance, they need to represent the needs and interests of different stakeholders and consider how these needs might be affected and/or benefited by hydropower development.

Conceptually, EIAs have weaknesses concerning their ambiguity, robustness and methods of assessment. Practically, EIA application is often hampered by the issues of timing, bias, improper monitoring, as well as the fact that mitigation measures are not always carried out as intended. In western developed countries, these weaknesses are partly addressed through public involvement in EIA processes. In the Mekong region in general and in Laos in particular, EIA processes are conducted with a lower degree of

public involvement than is required for hydropower projects elsewhere. Within this set up, there is a strong presumption that participation can be ensured through the local population's attendance in EIA processes. In practice, the fact that the local citizens are informed about the predicted project impacts and have attended the EIA meeting does not always equate to or is insufficient to ensure meaningful participation and comprehension. We conclude that EIA processes in Laos are hindered not so much by the need for capacity building (both technically and organizationally) but rather by the fact that it may not be readily transferable to other socio-political environments that do not have an active and outspoken civil society or where civil society is not fully informed and has restraints on its liberty to question and challenge.

EIA application requires certain institutional set-ups and arrangements to enable necessary follow up and monitoring of the assessed potential impacts. Lacking such set-up and arrangements, EIA application becomes largely a procedural exercise to fulfill funding requirements and has the potential danger of shaping EIA application as yet another bureaucratic hoop that the government has to jump through to meet donors' preconditions. In our opinion, EIA application in Laos will remain an environmental management exercise as long as the existing institutional set-up does not enable the Department of Environment and Social Impact Assessment (DESIA) of Ministry of Natural Resources and Environment (MoNRE) to enforce EIA standards and procedures. Though EIA does provide some value to the environmental management process, without addressing the problems of purpose and public engagement, its impact on the hydropower decision-making process will remain limited.

Currently, efforts to increase the standard of environmental management in the region are focused on improving scientific information and data. The Mekong River Commission plays an important role in introducing the 'science' element into the current debate in hydropower development (MRC FP Reports, 2009; MRC SEA Reports, 2010). Yet, scholars have also highlighted the relations between power and knowledge and their implication for the overall process of knowledge (re)production (Foucault, 1994; Haugaard, 2006; Molle et al., 2009). With this idea in mind, Keskinen et al. (2012) have identified the three most critical steps with regard to environmental impact assessment in the Mekong, bringing to light the need to move from individual projects to cumulative impact assessment; from purely technical to more inclusive analyses; and from separate studies to comparative assessments. We argue that for these transformations to have actual significance, they need to be better linked with more rooted application of EIAs, grounded in meaningful public involvement and participation in EIA processes.

References

- Aligica, P. D. (2006). Institutional and stakeholder mapping: Frameworks for policy analysis and institutional change. *Public Organization Review* 6, 79–90.
- Alshuwaikhat, H. (2005). Strategic environmental assessment can help solve environmental impact assessment failures in developing countries. *Environmental Impact Assessment Review*, 25, 307–317.

- Arthur, R. I., & Friend, R. M. (2011). Inland capture fisheries in the Mekong and their place and potential within food-led regional development. *Global Environmental Change*, 21, 219–226.
- Baghel, R., & Nusser, M. (2010). Discussing large dams in Asia after the World Commission on Dams: Is a political ecology approach the way forward? *Water Alternatives*, 3, 231–248.
- Baran, E. (2006). *Fish migration triggers in the Lower Mekong Basin and other freshwater tropical systems* (MRC Technical Paper No. 14). Vientiane, Lao PDR: Mekong River Commission.
- Baran, E., & Myschowoda, C. (2009). Dams and fisheries in the Mekong Basin. *Aquatic Ecosystem Health and Management*, 12, 227–234.
- Beierle, T. C. (1998). *Public participation in environmental decisions: An evaluation framework using social goals* (RFF Discussion Paper 99–06). Washington, DC: Resources for the Future. Retrieved from <http://www.rff.org/Documents/RFF-DP-99-06.pdf>
- Burawoy, M. (1991). *Ethnography unbound: Power and resistance in the modern metropolis*. Los Angeles: University California Press.
- Cashmore, M., Bond, A., & Cobb, D. (2007). The contribution of environmental assessment to sustainable development: Toward a richer empirical understanding. *Environmental Management*, 40, 516–530.
- Cashmore, M., Gwilliam, R., Morgan, R., Cobb, D., & Bond, A. (2004) The interminable issue of effectiveness: Substantive purposes, outcomes and research challenges in the advancement of environmental impact assessment theory. *Impact Assessment and Project Appraisal*, 22, 295–310.
- Dugan, P. J., Barlow, C., Agostinho, A. A., Baran, E., Cada, G. F., Chen, D., ... Winemiller, K. O. (2010). Fish migration, dams, and loss of ecosystem services in the Mekong Basin. *Ambio*, 39, 344–348.
- Ferguson, J. W., Healy, M., Dugan, P., & Barlow, C. (2011). Potential effects of dams on migratory fish in the Mekong River: Lessons from salmon in the Fraser and Columbia Rivers. *Environmental Management*, 47, 141–159.
- Foucault, M. (1994). So is it important to think? In J. D. Faubion (Ed.), *Power: Essential works of Foucault 1954–1984* (pp. 454–458). London, UK: Penguin Books.
- Friend, R. M. (2009). Fishing for influence: Fisheries science and evidence in water resources development in the Mekong basin. *Water Alternatives*, 2, 167–182.
- Fujikura, R., & Nakayama, M. (2009). Lessons learned from the World Commission on dams. *International Environmental Agreements*, 9, 173–190.
- Gajasesi, N., Heal, O. W., & Edwards-Jones, G. (2005). The Mekong river basin: Comprehensive water governance. In M. Finger, L. Tamiotti, & J. Allouche (Eds.), *The multi-governance of water: Four case studies*. Albany, NY: State University of New York Press.
- Government of Lao PDR. (2011). *Seventh national socio-economic development plan (2011–2015)*. Retrieved from <http://www.un.org/en/ga/president/65/initiatives/ldcs/laos.pdf>
- Halls, A. S., & Kshatriya, M. (2009). *Modeling the cumulative barrier and passage effects of mainstream hydropower dams on migratory fish populations in the Lower Mekong Basin* (MRC Technical Paper No. 25). Vientiane, Lao PDR: Mekong River Commission.
- Haugaard, M. (2006). Power and hegemony in social theory. In M. Haugaard & H. H. Lentner (Eds.), *Hegemony and power: Consensus and coercion in contemporary politics* (pp. 45–66). Oxford, UK: Lexington Books.
- Hirsch, P. (2006). Water governance reform and catchment management in the Mekong region. *The Journal of Environment and Development*, 15, 184–201.
- Hirsch, P. (2010). The changing political dynamics of dam building on the Mekong. *Water Alternatives*, 3, 312–323.
- Hortle, K. (2007). *Consumption and yield of fish and other aquatic animals from the Lower Mekong Basin* (Mekong River Commission Technical Paper No. 16). Vientiane, Lao PDR: Mekong River Commission.
- Hortle, K. (2009). Fisheries of the Mekong river basin. In I. C. Campbell (Ed.), *The Mekong: Biophysical environment of an international river basin* (pp. 197–247). New York, NY: Academic Press, Elsevier.
- International Association for Impact Assessment. (1999). *Principle of environmental impact assessment best practice*. Fargo, ND: Author. Retrieved from http://iaia.org/publicdocuments/special-publications/Principles%20of%20IA_web.pdf

- International Centre for Environmental Management. (2010, October). *Strategic environmental assessment of hydropower on the Mekong mainstream: Final Report for the Mekong River Commission*. Retrieved from <http://www.mrcmekong.org/assets/Publications/Consultations/SEA-Hydropower/SEA-FR-summary-13oct.pdf>
- International Rivers. (2011). *The Xayaburi dam fact sheet*.
- Johnston, L. (2008). *Lower Mekong river basin hydropower report*. Washington, DC: USAID/Washington, EGAT/ESP.
- Käkönen, M., & Hirsch, P. (2009). The anti-politics of Mekong knowledge production. In F. Molle, T. Foran, & M. Käkönen (Eds.), *Contested waterscapes in the Mekong region: Hydropower livelihoods and government*. London, UK: Earthscan.
- Karjalainen, T., & Jarvikoski, T. (2010). Negotiating river ecosystems: Impact assessment and conflict mediation in the cases of hydro-power construction. *EIA Review*, 30, 319–327.
- Kersten, C. (2009). Rethinking transboundary environmental impact assessment. *The Yale Journal of Environmental Law*, 34, 173–206.
- Keskinen, M. (2008a). Water resources development and impact assessment in the Mekong Basin: Which way to go? *Ambio*, 37, 193–198.
- Keskinen, M. (2008b). *Water management and impact assessment in the Mekong Basin: Analyzing the linkages between local, national and regional levels*. Finland: Water Resources Laboratory.
- Keskinen, M., & Kumm, M. (2010). *Impact assessment in the Mekong: Review of Strategic Environmental Assessment (SEA) & Cumulative Impact Assessment (CIA)* (Water & Development Publications TTK-WD-08). Espoo, Finland: Water & Development Research Group, Aalto University.
- Keskinen, M., Kumm, M., Kakonen, M., & Varis, O. (2012). Mekong at the crossroads: Next steps for impact assessment of large dams. *Ambio*, 41, 319–324.
- King, P., Bird, J., & Haas, L. (2007, March). *The current status of environmental criteria for hydropower development in the Mekong region. A literature compilation*. Vientiane, Lao PDR: WWF-Living Mekong Programme.
- Kisten, E., & McCornick, P. (2009, September 7). *Workshop Report: Assessing climate change risks, vulnerabilities, and responses in the Siphandone/Stung Treng area with a focus on protecting vulnerable ecosystems*. Durham, NC: Nicholas Institute for Environmental Policy Solutions, Duke University. Retrieved from <https://nicholasinstitute.duke.edu/sites/default/files/publications/siphandone-stung-treng-paper.pdf>
- Lamberts, D. (2008). Little impact, much damage: The consequences of Mekong River flow alterations for the Tonle Sap ecosystem. In M. Kumm, O. Varis, & M. Keskinen (Eds.), *Modern myths of the Mekong—A critical review of water and development concepts, principles and policies* (pp. 3–18). Espoo, Finland: Helsinki University of Technology.
- McCully, P. (2001). *Silenced rivers: The ecology and politics of large dams*. New York, NY: Zed Books.
- McDonald-Wilmsen, B., & Webber, M. (2010). Dams and displacement: Raising the standards and broadening the research agenda. *Water Alternatives*, 3, 142–161.
- McGee, B. (2010). Participation with a punch: Community referenda on dam projects and the right to free, prior, and informed consent to development. *Water Alternatives*, 3, 162–184.
- Mekong River Commission for Sustainable Development (MRC). (1995). *Procedures for notification, prior consultation and agreement*. Vientiane, Lao PDR: Mekong River Commission.
- Merrett, S. (1997). *Introduction to the economics of water resources: An international perspective*. Lanham, MD: Rowman & Littlefield.
- Middleton, C., Garcia, J., & Foran, T. (2009). Old and new hydropower players in the Mekong region: Agendas and strategies. In F. Molle, T. Foran, & M. Käkönen (Eds.), *Contested waterscapes in the Mekong region: Hydropower livelihoods and government*. London, UK: Earthscan.
- 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, 125–132.
- Molle, F., T. Foran, & M. Kakonen, 2009. *Contested waterscapes in the Mekong region: Hydropower, livelihoods and governance*. London: Earthscan.

- Nam Theun 2 Power Company (NT2PC). (2005, March). Environmental assessment & management plan—Nam Theun 2 Hydroelectric Project.
- Nelkin, D. (1975). The political impact of technical expertise. *Social Studies of Science*, 5, 35–54.
- O’Faircheallaigh, C. (2010). Public participation and environmental impact assessment: Purposes, implications, and lessons for public policy making. *ELA Review*, 30, 19–27.
- Porter, I., & Shivakumar, J. (2011). *Doing a dam better: The Lao People’s Democratic Republic and the story of Nam Theun 2*. Washington, DC: The World Bank.
- QSR International, (2008). What is qualitative research? <http://www.qsrinternational.com/what-is-qualitative-research.aspx>
- Richter, B., Postel, S., Revenga, C., Scudder, T., Lehner, B., Churchhill, A., & Chow, M. (2010). Lost in development’s shadow: The downstream human consequences of dams. *Water Alternatives*, 3, 14–42.
- Sadler, B., Verocai, I., & Vanclay, F. (2000, November). *Environmental and social impact assessment for large dams*. Cape Town, South Africa: World Commission on Dams (WCD).
- Salzman, J., & Thompson, B., Jr. (2007). Utilitarianism and cost-benefit analysis. In *Environmental law and policy*. New York, NY: Foundation Press.
- Sayatham, M., & Suhardiman, D. (2015). Hydropower resettlement and livelihood adaptation: The Nam Mang 3 project in Laos. *Water Resources and Rural Development*, 5, 17–30.
- Sneddon, C., & Fox, C. (2007). Power development, and institutional change: Participatory governance in the lower Mekong basin. *World Development*, 35, 2161–2181.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. New Delhi: Sage Publications
- Suhardiman, D., M. Giordano. (2014). Legal plurality: An analysis of power interplay in Mekong hydropower. *Annals of the Association of American Geographers* 104 (5): 973-988.
- Suhardiman, D., M. Giordano, F. Molle. (2015). Between interests and worldviews: The narrow path of the Mekong River Commission. *Environmental Planning C: Government and Policy* 33 (1): 199-217.
- Suhardiman, D., S. de Silva, J. Carew-Reid. (2012). Policy review and institutional analysis of the hydropower sector in Lao PDR, Cambodia, and Vietnam. IWMI Report submitted to CPWF.
- TEAM Consulting Engineering and Management Co. Ltd. (2010, August). Environmental impact assessment: Xayaburi Hydroelectric Power Project Lao PDR.
- World Bank (WB). (2010). *Environmental assessment*. Retrieved June 23, 2010, from <http://web.worldbank.org/>
- Yin, R. K. (1994). Case study research: Designs and methods. *Applied Social Research Methods Series 5*. New Delhi: Sage Publications

Appendix 1
Reviewed policies and legal frameworks in land-water-environment

Lao PDR	Cambodia	Vietnam
The Seventh National Socio-Economic Development Plan (2011–2015)	The Rectangular Strategy for Growth, Employment, Equity and Efficiency (2003–2008)	National Socio-Economic Development Orientation (2001–2010)
National Growth and Poverty Eradication Strategy (NGPES)	National Strategic Development Plan (2006–2010)	Law on Electricity (2007)
Law on Investment Promotion (2009)	National Program for Sub-National Democratic Development (2010–2019)	National Energy Development Strategy up to 2020
Tax Law (2010)	Power System Development Plan (2007–2022)	6th Power Development Plan (PDP) (2006–2015)
Electricity Law (1997, 2010)	Renewable Energy Action Plan (2003)	7th Power Development Plan (2012–2017)
Power System Development Plan (2004)	National Water Resources Policy (2004)	Development Plan for the Central Economic Focal Region (2010–2020)
National Policy on Sustainable Hydropower (2006)	MOWRAM Strategic Development Plan (2006–2010)	River Basin Master Plan
Renewable Energy Development Strategy (2010)	Law on Water Resources Management (2007)	Provincial Master Plan
Water and Water Resources Law (1996)	Land Law (2001)	Environment Protection Law (2005)
National Water Resources Profile (2008)	Land Policy (2009)	Decree no. 80/2006/ND-CP on Strategic Environmental Assessment (SEA)
Draft National Water Resources Policy (2010)	Master Plan for Fisheries (2001)	Circular 08/2006/TT-BTNMT on the required contents on an SEA report
WREA organization and staff arrangements for IWRM	Fisheries Development Action Plan (2005–2008)	National Hydropower Plan (2007)
Environment Protection Law (1999)	Law of Environment Protection and Natural Resources (1996)	Decree no. 197/2004/ND-CP on procedures for compensation
Decree on the agreement and endorsement of the National Strategy on Environment years 2020 and Action Plan for the years 2006–2010 (2004)	Protected Area Law (2008)	Decree and Circular no. 116/2004TT- BTC on the roles and responsibilities for implementation of resettlement projects
Land Law (2003)	Sub-decree on EIA process (1999)	
Decree on state land lease or concession (2009)	Sub-decree no. 19 on social land concessions (2003)	
Instruction as regards the implementation of decree on state owned land approval for lease or concession (NLMA, 2010)	Forestry Law (2002) and National Forest Policy (2002)	

Decree on Compensation and Resettlement of People Affected by Development Projects (STEA, 2006)	Sub-decree no. 79 on community forestry management (2003)
Regulations for Implementing Decree on Compensation and Resettlement of People Affected by Development Projects (STEA, 2006)	Strategy for Agriculture and Water Resources (2006–2010)
	Sub-decree on water pollution control (1999)
