

**Comments concerning the Environmental Impact Assessment and Social
Impact Assessment documents provided for the Xayaburi Hydroelectric
Power Project, Lao PDR. August 2010**

**A public document prepared by TEAM Consulting Engineering and
Management Co. Ltd for the Project developers, CH. KARNCHANG Public
Company Ltd.**

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Foreword

I write this short report in good faith as a concerned member of the international community who has lived and worked in Northeast Thailand and Lao PDR for over a dozen years, including posts as a wetlands technical advisor with the IUCN (The World Conservation Union) on the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP), as a small-scale aquaculture extension advisor with a United Nations Development Programme (UNDP) project in Xayaburi Province and an independent researcher on a number of hydropower projects in the Mekong Region. Beyond my professional involvement with community development, natural resources conservation, aquaculture, fisheries and rural livelihoods related projects and research since 1990, I have spent countless hours beside, on and in the waters of the Mekong River and appreciating its rich and diverse cultures from northern Lao PDR down to the Delta. I can declare a personal attachment to the Mekong that is deep, enduring and ethereal. Hence, I am only too conscious of the fact that it is not only an economic lifeline for millions of people dependent on its natural bounty for their livelihoods; it also occupies the spiritual lives of many others as the “Mother of Waters”. Thus, even though I currently live far away from the Mekong’s shores, I believe that I too should have a minor stake in the decisions that are made today about what kind of condition it is handed on to future generations. In short, the Mekong River transcends its geographical borders and touches the lives and thoughts of unknown numbers of people around the world.

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Summary of main points

The EIA and SIA documents compiled by the consulting company hired by the project developer are of a standard that would basically be unacceptable in most nations of the world, as they are too spatio-temporally narrow in scope, lack important detail and do not adequately take into account the severity of impacts anticipated from such a major infrastructure project on a major international river, that is noted as the most important freshwater fishery in the world. Specifically, the following main weaknesses noted from the two documents are summarised below:

- The importance and pivotal role of local fisheries on the Mekong as part of local livelihoods are poorly understood and undervalued in the reports, perhaps due to inadequate assessment methods and approach.
- The extent of predicted environmental impacts in the EIA is assumed to be confined to just the immediate dam area and upstream headpond-reservoir, but ignores the far wider eco-hydrological impacts predicted by fishery experts for long distances up and downstream of the dam. As a result, communities lying further afield will be impacted through diminished livelihoods too, but are not currently considered in the compensation and mitigation proposals.
- In terms of impact severity, the EIA predicts that impacts will vary between ‘moderate’ for the aquatic ecology/fishery and surface water quality components, to ‘minor’ for all other components (see Annex 1). In most cases, it believes these impacts will be confined to just the construction phase and there will be few ongoing impacts during the operation phase, by which time livelihoods will have been ‘restored’ by a resettlement program and environmental management plan. The experience at other dams in the Mekong region suggests that this is an over-optimistic assessment and the period of livelihood restoration may take several decades, if at all.
- Mitigation methods proposed to restore impacted migratory fisheries are clearly inadequate and place too much faith in fish pass technology, which has proved unsuccessful on tributary dams and is widely believed to be unfeasible on the Mekong mainstream, while fish stocking has never been proven to work at such reservoirs, where riverine habitats are massively simplified and degraded.
- The EIA and SIA do not seem to have taken into account either the lessons learned at other projects in the region (e.g. Theun-Hinboun in central Lao PDR; Pak Mun in Northeast Thailand) termed as “run-of-river” projects; or the wider observations on the risks associated with mainstream dams contained in the MRC’s Strategic Environmental Assessment (SEA); or a wide range of other documents available regionally and internationally on the impacts of large dams on tropical river systems and dependent populations, that might have helped the consultants contextualise the dam’s likely impacts somewhat more accurately.

INTRODUCTION

The comments contained in the short report that follows is a submission to the prior consultation process of the Procedures for Notification, Prior Consultation and Agreement (PNPCA), as outlined in the 1995 Mekong Agreement, signed by the four nations of the Lower Mekong Basin, that constitute the Mekong River Commission (MRC). These comments are made in advance of the MRC Joint Council meeting to be held on 19 April 2011 to consider a decision concerning the Xayaburi Hydroelectric Power Project in northern Lao PDR. The comments principally address the livelihoods aspects of the Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) submitted by TEAM Consulting Engineering and Management Co Ltd (henceforth TEAM) to the Xayaburi project developer Ch. Karnchang Public Company Limited (henceforth, Ch. Karnchang), as part of the statutory requirements relating to large infrastructure development under Lao PDR law. Both documents are publically available for download from the MRC's website (<http://www.mrcmekong.org/>) having appeared only in late March 2011, although the documents are dated August, 2010, suggesting an unacceptable delay in releasing them into the public domain, and less than a month before the end date of the public consultation (PC) process. Hence, these comments are made in some haste and are not supposed to be comprehensive, but only point out some of the major deficiencies that exist in these documents.

The EIA and SIA make no reference to the MRC's Strategic Environmental Assessment (SEA) of hydropower projects on the mainstream Mekong, a key document prepared between May 2009 and September 2010, when the final report was published. Neither do the EIA/SIA authors make use of the extensive collection of MRC's technical reports detailing livelihoods and environmental issues, especially related to fisheries, with the exception of one 2002 report. The omission of any reference to the SEA document, its findings, conclusions and recommendations, many of which were available and part of a public consultation process well before TEAM's EIA and SIA were completed is a matter of importance that cannot be understated. The discrepancies between the EIA and SIA findings and conclusions in terms of potential dam impacts on livelihoods of people, not just locally in the immediate dam vicinity, but across national boundaries downstream to communities in Thailand, Lao PDR, Cambodia and Viet Nam are too stark to be ignored or downplayed.

Some preliminary remarks concerning the Mekong River and local livelihoods

Before addressing the EIA and SIA documents themselves, it would be instructive to raise some widely acknowledged general facts and common understandings about the Mekong River and its crucial role in the livelihoods of millions of people, living both next to or near the river and directly dependent on it for income and subsistence, or living more distant from the river and less directly dependent on its ecosystem services. These are germane to any discussion of any Mekong mainstream dam project, due to the implications to any disruption to the river's natural flow and sediment regime and barrier impacts to fish migrations. The most important are outlined below:

- The livelihoods and food security of the majority of people living in the Lower Mekong Basin are closely linked to the Mekong River system and the natural resources it supports.
- Approximately 60 million people live in the Lower Mekong Basin, mostly in rural communities and many of whom are vulnerable to ecosystem shocks with relatively few alternative livelihood choices open, beyond urban migration.
- The Mekong River system is recognised to be the largest freshwater fishery in the world, with an estimated yield of 2.6 million tonnes. This makes it more significant than the North Sea fishery.
- The majority of the Mekong's valuable fisheries are based on long and medium distance fish migrations for spawning, feeding and life-cycle completion reasons, including downstream egg and larval drifts.
- The value of the fishery is estimated to be worth over \$3 billion at first-sale value. This excludes a vast regional network and industry of value-adding and processing that see Mekong fish and fish products move across national borders to feed and employ people, economically supporting communities hundreds or even thousands of kilometres from the point of capture.
- The incredible productivity of the Mekong's capture fisheries are based on its natural flow regime, or "flood pulse", with the timing, duration and extent of flooding critical to maintaining life cycles and habitats of numerous economically important species. Equally important to the floods are maintenance of dry season flows and deep pool habitats in their natural state, that act as refuges for many species of fish.
- Altered flow, nutrient and sediment regimes associated with so-called 'run-of-river' dams or barrages on other rivers in the Mekong Basin have been documented as causing a 90 % decline in catches in the project area, such as was recorded at the Pak Mun Dam in Thailand.
- There have been frequent reports of declines in fish catches (both in terms of diversity and quantitative measures) and other aquatic resources harvested affecting livelihoods of populations in the parts of the Mekong Basin in northern Thailand and Lao PDR situated downstream of Yunnan, since the start of a dam building programme in China in the early 1990s.
- Natural floods, seasonal flows and sediment-nutrient regimes are considered essential for maintaining soil fertility and natural/agro-ecosystem productivity and health on floodplain wetland systems in the Lower Mekong Basin, including the populous Mekong Delta in Cambodia and Vietnam. Rice and other crop yields, along with many wild plants harvested by riparian communities are partly dependent on the sediments and nutrients transported and deposited by the river during annual flooding episodes.
- The MRC (2010) 'State of the Basin' report notes, "Dams are a barrier to fish migrations up and down rivers and mainstream dams in the middle and lower reaches of the Mekong could affect more than seventy per cent of the Basin's catch." Fish passes and other mitigation measures are regarded as largely ineffectual and problematic with fish migrations of the complexity and dams of the scale and height proposed for the Mekong. There are few mitigation success stories in the region to draw from, but many failures.
- The river is facing numerous environmental threats beyond those posed by dams alone, but the impacts of dams and other flow-blocking barrages (mainstream and tributary) both

compound and add to these other threats, simplifying complex ecosystems that support human and natural life far beyond the immediate confines of the river itself.

- The SEA has recommended that any decision to proceed with the proposed mainstream dams is postponed for at least ten years, until the implications of building even a single dam across the Mekong are better understood.

It is against this basic context and set of understandings about the resource and dependent human populations that I examine the EIA/SIA documents. One might have imagined that acknowledging some or all of these easily obtainable factual statements would have been the starting point for objectively and impartially examining the potential livelihood impacts of the Xayaburi Hydropower Project for the consultants themselves, given the responsibilities and risks their task entailed. But apparently, they preferred to approach the wider Mekong River in a virtual information vacuum that might have been appropriate for a domestic Thai dam project some thirty years ago and choose to ignore the wealth of information resources easily available from a simple Internet search or in the MRC library, for instance, that they might have drawn on to at least make their report appear slightly more intellectually honest and credible.

Comments on content of EIA regarding livelihoods

Sections of report with passages relating to “livelihoods” component considered relevant:

- Chapter 4: Existing Environmental Conditions
- Chapter 5: Environmental Impact Assessment
- Chapter 6: Mitigation Measures
- Chapter 7: Monitoring Program
- Chapter 8: Conclusions and Recommendations

The first immediate observation is that the EIA report is very sparse on detail concerning livelihoods impacts of the proposed dam project. At the same time, it contains much information that is frankly irrelevant, out-dated, too general or of marginal importance to anyone wishing to learn about what the dam’s main environmental impacts are likely to be and what these imply to the livelihoods of affected populations. Whole sections or fields of critical information normally required to make an even partly-informed decision regarding such a costly, complex and wide-reaching infrastructure project appear to be missing. It is clearly based on a very limited timeframe of fieldwork, that would not have allowed more than a fleeting insight into the lives of the people and communities to be impacted, or how their livelihoods relate to and depend on the riverine and terrestrial resources to be impacted. In short, it lacks intellectual depth, breadth and rigour in methodology and analysis.

Some major limitations identified:

Geographical and temporal scope of study

The EIA team conducted spatially and temporally very limited fieldwork and considered impacts arising over a fraction of the probable impact zones arising from the project. These are noted below, under the section headers provided in the EIA:

“Aquatic Ecology, Fisheries and Aquaculture” (Section 4.2.1)

Conducted a fieldwork survey at just 6 sites in total. These are located in a range stretching on the mainstream from just 2 kms downstream of the proposed dam site to 20 kms upstream. No sampling took place on tributaries at all. This is inadequate to make any conclusions about the local fisheries, much less the larger picture about potential impacts along the Xayaburi to Luang Prabang stretch of the Mekong river. Based on the fact that the reservoir headpond extends 102 kms upstream from the dam and the impact zones from the dam will extend many hundreds of kilometres upstream and downstream of the dam, affecting fish migrations and aquatic ecology in general, then every single village in the various impact zones upstream and downstream from the dam should be surveyed in-depth. This would be usual practice in any transboundary impact project EIA. This would imply surveying villages in both Lao PDR and Thailand to get a reasonable baseline picture of the current situation from which to predict impacts.

The surveys were conducted over a period of just 3 days (23-25 November, 2007) in the early dry season and 4 days in the late dry season (10-14 March, 2008), which is an inadequate time period to get more than a brief snapshot of fisheries activity and importance. The EIA team conducted limited net sampling of fish populations at a handful of locations only. The capture fisheries component should normally be studied in depth across the entire impact zones upstream and downstream over every month and flow condition, ideally during the course of perhaps 5-6 years minimum period to establish a baseline. Periods coinciding with peak fish migrations are particularly important and require a special focus. Without such hard data, the project developers will inevitably open themselves up to criticism and possible later claims for compensation from fishing communities and other stakeholders that believe they have suffered losses as a result of the dam's operations, both in and outside of Lao borders. The developer therefore needs to be fully aware of baseline fisheries data against which claims might be judged.

“Terrestrial Ecology” (Section 4.2.2)

Forest Resources:

Temporally, the survey work for this section appears to have been completed in just a 5-day period in January 2008. No further follow-up work is noted. The EIA estimates that over 57 km² of land will be lost to the construction camp and associated area, dam site area, transmission line corridor and new access road (p.3-3) during the construction phase (8 years), but the implications of this are not properly investigated in the EIA.

This section uses sampling methods that are not fit for purpose, as they did not involve the participation of villagers and were not triangulated against other more balanced methods. The estimate of 165 species of plants in the flood impacted zone of the reservoir is likely a serious under-

estimate, given the known far-wider plant biodiversity found in Mekong riparian vegetation communities elsewhere¹.

Wildlife Resources:

Based on field survey work carried out in January 2008 only (number of days not specified). Only considers 4 major vertebrate classes – birds, mammals, amphibians and reptiles. Identifies mostly common and abundant species. Likely an under-estimate of actual wildlife diversity present in area surveyed, and relies too heavily on direct observation and not enough on villager information, which surely would have increased the species list considerably. Does not specify habitat locations of species identified and appears to confine study to the immediate vicinity of dam site and possibly along headpond. Does not consider impact of access roads, contractor’s camp, transmission line route and other gross disturbance aspects expected from dam project.

“Land Use / Agriculture” (Section 4.3.1)

Study only scoped villages upstream of dam site situated next to Mekong River lying lower than 275 masl. This covered only 10 villages and a kilometre-wide stretch along both banks of the river upstream of the dam, that was apparently surveyed in just 3 days. Table 4.3.1-1 notes that the survey did not include within the river channel itself, thus excluding riverbank vegetable gardens from the survey, an important part of villager livelihoods in the dry season (even though these agro-ecosystems are represented in photos). The results given are very superficial and at a gross level of analysis, not broken down by village and river reach as they should be. It appears to totally disregard villages downstream of the dam as being impacted by altered flow regimes affecting dry season riverbed and bank agriculture and does not adequately represent villages lying further upstream than near Ban Xalan and Ban Xing in Luang Prabang province.

“Mineral resources” (Section 4.3.2)

Scant and irrelevant secondary data provided on mineral resources found elsewhere in Lao PDR, with minimal empirical data from the impact zone. Mentions just one single village in a few photos – Ban Pak Phai – recording villagers sieving for gold along the banks of Mekong in dry season. No attempt to spatially or temporally record the activities surrounding this or other local mineral resources, that will be impacted by the dam project, either up or downstream. For example, use of sand, gravel or rocks from the river channel for local construction are not recorded, which could have a serious knock-on effect to local development options if they were lost.

Transportation & Navigation (Section 4.3.3)

¹ For example, James Maxwell identified 731 species of plant from the Siphandone wetlands in southern Lao PDR during 1997-98, albeit from an area of higher habitat diversity (Daconto, 2001).

Provides only superficial primary data, coupled with some very general, secondary information, that is of limited use in understanding project impacts on peoples' livelihoods. Mostly focused on larger commercial boat transportation. No breakdown of boat ownership (including fishing boats) and traffic by village (local or commercial), with importance to household socio-economics or wider economy. Who will be impacted, where, for how long and how? Will the dam impair river boat traffic or will it be facilitated by higher water levels? Will new access roads make travel and transport from villages simpler, faster, cheaper or will some villages or households lose out? Will the elevated water levels flood existing roads or access routes and if so, where? What will be the socio-economic impact on the ferry crossing area at Tha Deua? Will fluctuating flows caused by diurnal changes in power generation have an operational impact on boat traffic and safety of people and property downstream? Will underwater hazards (e.g. rock outcrops and reefs) become more dangerous to navigation? How will impacts be felt amongst different socio-economic groups?

Impacts predicted in EIA

“Aquatic Ecology, Fisheries and Aquaculture” (Section 5.2.1)

The report mistakenly believes that: “Transformation of the habitat of a river with rapids into to standing ecosystem [sic] due to impoundment will not occur for Xayaburi Hydroelectric Power Project due to run-of-the-river scheme”. This low-impact myth of “run-of-river” dams is not supported by any evidence and if TEAM consultants would like some evidence of the impacts of rapids being transformed by such projects, then they need go no further than study the World Commission on Dams report on the Pak Mun Dam (Amornsakchai et al, 2000) and many other studies done showing multiple, serious impacts from such low storage dams (e.g. Roberts 1993; 2001). The report authors are also labouring under several other common misconceptions, not supported by evidence in the Mekong Basin, namely that fish productivity will be improved in the upstream headpond, that the riverine species found in the Mekong river in that area are adaptable to reservoir conditions, that biodiversity will not be adversely impacted by the habitat and flow changes caused by the dam, and that fishers will be able to simply adapt their fishing techniques and tools to take advantage of the new fishery conditions. All of these are fallacious and have been debunked many times before, but are still persistent amongst hydropower-tame consultants. The EIA also mistakenly assumes that a fish pass facility will allow passage of Mekong fish migrations over a height differential of 24 m, something which most experts concur is highly unlikely (refer to ICEM, 2010). The net result of these misconceptions is that the EIA is unable to predict the likely impacts to fisheries and aquatic resources that will occur, if the dam project is allowed to proceed. Therefore, the developer itself and the Lao government decision-makers are being poorly served by not being provided with correct and factual information². However, most at risk from the poor quality assessment work of TEAM are the hundreds of communities across national boundaries that

² By contrast, the Fisheries Expert Group who contributed to the Prior Consultation Project Review Report of the Mekong River Commission Secretariat found that, “the proposed dam and reservoir at Xayaburi could affect between 23 and 100 species including five in the IUCN Redlist of Threatened Species” and could possibly lead to the extinction of the naturally occurring Giant Mekong Catfish, which would not be able to migrate past the dam, even with a fish ladder in place.

will be severely impacted as a result of the dam project proceeding, and may well demand compensation from the developer at a later date.

The EIA fails to adequately consider direct and indirect impacts of other aspects of the hydropower project on aquatic resources and fisheries, especially road building and transmission line construction on streams and other watercourses, which is a serious oversight.

Terrestrial Ecology (Section 5.2)

Forest resources:

Expects impacts to be minor and localised. Only considers and values direct loss of trees to construction activity and along banks of headpond in flood zone. Seriously underestimates serious impacts on local communities that rely on these resources, in particular the loss and degradation of non-timber forest products (NTFPs)³. Mistakenly assumes there will be some positive benefits of raised water levels “greening” riparian forest and increasing biodiversity.

Wildlife resources:

Believes impacts on wildlife resources will be at a “low level”. But as it has likely seriously underestimated the local biodiversity (quantitatively and qualitatively) by being highly selective in its survey methods, then it will also be underestimating the impacts on livelihoods of communities and households. These impacts could be expected to be serious at the local level, especially near the dam site and along the access road, not only by construction activities directly, but by increased hunting pressure on both aquatic and terrestrial wildlife by thousands of construction workers and camp followers brought into the area over a number of years, which will have a significant ripple effect on wildlife depletion in Sayaboury and Luang Prabang provinces far beyond the immediate dam site and headpond. This will inevitably affect local livelihoods and food security. There does not appear to be any mention of issues surrounding the environmental impacts of and subsequent management of the construction camp and attendant follower issues in the EIA, during the 7-8 year predicted construction phase. This will cause multiple and serious impacts, especially on wildlife resources that will have a footprint far wider than presently recognised in the documents.

Land Use /Agriculture (Section 5.3.1)

Recognises some loss of livelihood benefits to villagers from loss and degradation of agricultural land, forest resources, biodiversity, access and grazing in the villages that lose land to construction activities and reservoir flooding. Assumes impacts are minor and localised. Does not quantify these.

States that 10 villages only will have to partially or totally resettle. Notes that the villages of Ban Khok Yai, Ban Houay Xong, Ban Pak Lan of Nan District, Luang Prabang will have to be relocated entirely due to flooding. Describes this impact as “moderate”. Mentions that 29 villages will lose dry season vegetable gardens to the reservoir. Does not quantify these.

³ Some of the more important NTFPs are noted briefly in the SIA on p.4-13 to 4-15, but the scale of their contributions to local livelihoods is not adequately assessed.

Describes impacts of access roads and transmission line construction as being of “low level” during construction and operation period. Does not quantify these. Fails to describe impact of construction camp/s on local land use, agriculture and livelihoods.

Mineral Resources (Section 5.3.2)

States that there will be impacts from flooding in the reservoir zone only on 25 villages where people are involved in dry season gold panning. Does not quantify number of households or incomes. Does not mention direct compensation for loss of livelihood opportunity, but recommends income restoration activities be carried out. Believes overall impacts during dam construction and operation will be minor. Ignores potential impacts downstream to gold panning and other mineral abstraction activities all along the Mekong, such as digging sand, gravel and rocks⁴.

Transportation / Navigation (Section 5.3.3)

EIA believes that there will be moderate level impacts on river navigation during construction period due to obstruction of boats, but river transportation will return to normal during dam operation due to instalment of navigation lock at barrage that will accommodate boats up to 60 tonnes deadweight. Does not specify whether small, local boats will have the rights of passage or how they will be impacted by this massive construction project? Contains very little information from which it is possible to draw any conclusions concerning livelihoods of those households that rely on the Mekong for transportation and fishing, including the basis for “low level” impact predicted by the EIA.

Public Health and Nutrition (Section 4.4.1)

This section has very little to report on the links between the aquatic and terrestrial natural resources that will be directly impacted by the dam and human health and nutrition. This is a remarkable oversight.

In Section 5.4.1, the EIA superficially notes some of the negative social and health impacts a large-scale dam construction project can bring to local communities. These are of a very generic nature and are not dealt with in sufficient detail or scope to give a realistic picture, given the scale and budget of the project. Likewise, it understates the potential level of socio-economic impacts resulting from the access road and 200 km high voltage transmission line construction and subsequent operation on nearby communities, which can cause a range of livelihood and public health externalities.

⁴ This issue is picked up in the SIA, where it is noted that in Ban Houay Dua, Nan District (p.4-10) local people dig sand and gravel between January to May each year, earning an income of about 50,000 kip/household/day. In Ban Pak Khon, Nan District, (p.4-16) the average income from sand and gravel extraction is noted to be on average 200,000 kip/hh/day and there is one commercial sand digging concession here which reportedly earns the owner 350 million kip per annum.

Aesthetic / Tourism / Archaeology (Section 5.4.2)

Includes some irrelevant historical and tourist-oriented information of the sort that can be found in guidebooks for areas of Lao PDR lying outside the impact zones, but very little hard data of direct relevance to the river stretch in question and upstream/downstream impacts of dam project. In the dam site area and upstream along the reservoir impact zone the EIA provides some low quality general information on a couple of cultural or tourism-related sites, but gives no real sense of their socio-economic or cultural importance. It is noted however, that there appears to be a riverside site (named “Pha Daeng”) of some cultural and spiritual/religious significance located just upstream of the dam site. Apparently the “Chao Pho Pha Daeng” shrine and much of the lower part of the site would be inundated by the reservoir (p. 5-25). In addition, all temples lying below an altitude of 280 m will be inundated, according to the EIA. An important cultural site in front of Chompet Temple opposite Luang Prabang, used during the New Year’s festivities by townspeople and tourists, would be flooded by the reservoir and lost for future use.

Other Qualitative aspects of findings

- Unsystematic data gathering - The EIA appears to have copied sections verbatim from MRC reports⁵, often with little or no relevance to the local study but of a very general nature. It provides next to no aquatic ecology data from the local area upstream and downstream of the dam in the direct impact zone, nor details of how local communities utilise the biodiversity as part of their livelihoods. The authors appear to have had little experience in asking the right questions, collecting the data necessary for a fishery component, or appreciating the scale of the problem they are confronted with in assessing such a large and important river system.
- Low confidence level in data - It claims only 37 species of fish were caught during its sampling, all of a small size, which is but a fraction of the fish biodiversity known to inhabit this section of the Mekong, thus highlighting the inadequacy of their sampling method⁶. They could have easily found a higher fish species range by sampling the fishing gear of local fishers and local markets, that would have provided a far better indicator of the fisheries diversity. One might expect fish biodiversity of at least 150 species could be identified within a few days of surveys by recognised experts working with local fishers along this stretch. TEAM failed to provide any data whatsoever about local fishing methods and species caught, catch yields, incomes from fish and other aquatic organisms, numbers of full and part-time fishers, gender questions, household fish consumption, fish markets or a host of other relevant information related to local fishing livelihoods, at the present time and historically. What little data that is provided is totally inadequate and poor quality information for any

⁵ NB: Not all reports cited are actually listed in the EIA Reference list, which contains only four citations.

⁶ It should be noted that the SIA reports that fishing households catch on average 5kg/hh/time from the Mekong at Ban Khok Yai, Nan district, compared against the EIA’s fish sampling team’s efforts at six stations over three days netting to catch just 3.15 kg of fish (see Table 4.1.2-6 in EIA)

degree of confidence in likely dam impacts to be made, even at the very local level (i.e. unfit for purpose).

- While claiming that fish biodiversity is “low” in the Mekong river near the dam site (p. 6-8), the EIA makes the unsupported claim that the “fisheries activities presently practiced have negative impact on biodiversity”. This blaming of local fishers for resource degradation is somewhat ironic, given that they are apparently unaware of the limitations of their own sampling techniques for uncovering fish biodiversity, nor the magnitude of the impacts a large dam would have if built on the most important freshwater fishery on earth.
- EIA fails to assess or record the many other aquatic fauna and flora that are well-known to form an important part of the livelihoods of Mekong lowland communities, in terms of nutrition and income, including amphibians, insects, crustacea, and plant species, including the edible freshwater algae (*kai*) found in the Mekong and widely preserved and sold during the dry season months.
- Failure to identify food security aspects of fisheries – the limited information in the EIA has failed to provide any sound information relating to local food security questions and substitutability of food and protein intake from fish, presently caught at relatively low opportunity cost, with other forms of animal protein. This would need a thorough survey done at household level to obtain baseline data across a large number of communities, from which later surveys can be compared against, to ascertain impact with any degree of confidence.
- Failure to relate the study with any other known impact studies from other dams in the region, in order to make predictive statements about potential impacts. This is especially surprising, as TEAM conducted the original EIA for the Pak Mun Dam in Thailand, which has a large body of studies related to fisheries impacts, both in the public sphere and available from the Thai Department of Fisheries, which might have helped them to understand the kind of order of magnitude of impacts to expect from a similar type of dam design. They also have failed to read the impacts predicted from regional fishery experts contributing to the SEA document, which would have given them some perspective on the issue.
- The EIA gives different lengths for the headpond-reservoir at various points in the text, varying between 45 kms and 102 kms⁷ long. There was clearly some confusion amongst the different component authors about what they were actually assessing on this very basic point of fact, thus providing low confidence in the overall quality of the report’s findings.

Mitigation Measures proposed

Aquatic Ecology & Fisheries

The main fishery mitigation measures proposed are building two fish passes at the dam and operating a restocking programme in the newly created reservoir, including building a state-operated fish hatchery. The EIA also proposes controlling and curtailing fishery methods by local people, suggesting that they are the main source of any fishery declines noted for the river. The clear message given by fishery experts, such as those contributing to the SEA, is that the mitigation

⁷ The SEA assumes the reservoir will be 102 kms long. The Prior Consultation Project Review Report predicts that there will be a backwater effect caused by the dam of up to 200 kms upstream in low-water conditions, thus inundating channel habitat and possibly riverbank agriculture areas that would otherwise have been productive.

of dam impacts on large fish migrations up and down the Mekong is virtually impossible, apart from on a rather limited basis⁸. The mitigation measures proposed in the EIA strongly reflect the fact that the authors appear not to be fully aware of the level and extent of impacts on fisheries to be expected from the dam project. Furthermore, there is little evidence from other dams in the region (e.g. Theun-Hinboun headpond or Pak Mun Dam) that the measures proposed, such as supplementary stocking, will have more than a limited benefit to restoring fish populations, due to the degraded carrying capacity of the riverine environment to supporting healthy fish populations. Fishing based livelihoods are likely to decline rapidly, once construction begins, and no amount of effort on the part of the developers is likely to restore them. Other livelihood options will need to be substituted for fishing, in other words.

Terrestrial Ecology

Forest resources: Suggests there is only need for some minor mitigation measures to be conducted during construction period and none during the operation phase of dam. Ignores ongoing loss of ecosystem services and multipurpose benefits from forests for local livelihoods that would be caused by dam construction in the reservoir footprint, along the transmission line and road corridors.

Wildlife resources: Provides no worthwhile mitigation measures during construction, and recommends zero mitigation during operation phase. Clearly misunderstands the scale and nature of impacts, both to wildlife and dependent human populations. Seems to have little concept of ecosystem services provided by either healthy terrestrial or aquatic ecosystems.

Land Use / Agriculture (please refer to the Section below covering this issue in the SIA – “How does the SIA propose to compensate for lost or negatively impacted livelihoods?”)

Mineral Resources

Villagers losing income from lost gold panning opportunities⁹ in the Mekong channel are not to be compensated directly, but will join the “income restoration programme” of the dam developer, no doubt in conjunction with Govt of Lao PDR. The record of such programmes is very patchy indeed, and there are many recorded instances of failure and further impoverishment resulting (see International Rivers, 2008).

Transportation/Navigation: The mitigation measures mentioned in EIA ignore or are essentially irrelevant to local livelihood impacts.

⁸ The contentious nature of attempting to mitigate massive seasonal fish migrations with a fish pass facility is dealt with in detail in the Fishery chapter of the SEA and Annex 4 of the Prior Consultation Project Review Report (Mekong River Commission Secretariat, 2011)

⁹ The SIA household survey estimates that 840 h/h involved in gold sieving and 130 h/h involved in sand extraction will be impacted in the reservoir area.

Aesthetic / Tourism / Archaeology

The mitigation measures proposed appear very superficial and top-down, with no indication whether they would be attractive or feasible for the local people impacted. For example, it proposes just relocating the Chao Por Pha Daeng shrine near the dam site to the cave further up the hillside and simply relocating temples to the resettlement villages. Have these proposals been made with the full and informed consent of the affected parties? Do the affected villagers fully understand the implications of the dam impacts? Do they realise the potential impacts on their livelihoods? Are they equipped with enough knowledge to make any decisions about these major issues? Are all the townsfolk of Luang Prabang (including monks and religious figures) and the people who make their living there for a week or so each year during the New Year festival aware that they will lose the common land on which the festivities have traditionally been held?

Comments on content of SIA regarding livelihoods and mitigation and compensation measures proposed

Some critical issues that arise out of the SIA, following on from the poor quality of information related to livelihood impacts presented in the EIA.

Where are the project impact areas or zones?

The SIA assumes them to be:

- The dam site and “appurtenance structure”
- The “pond area” i.e. the headpond-reservoir
- The new built access road from north of Xayaburi town to the Mekong River and then south along the banks of the new reservoir to the dam site.
- Transmission line
- Resettlement area/s
- “Other concerned area/s to be impacted by project construction and operation”

In other words, areas beyond the confines of the immediate dam site, reservoir, access road and transmission line corridor are not considered project-impacted. Thus, the Mekong River upstream of the reservoir and downstream of the dam is ignored, even though leading experts and specialists from around the world recognise these to be impact zones.

How many villages, how many people will be impacted by dam?

This simple question is not clearly addressed in the SIA. Section 4.1 “Profile of Affected Districts and Villages” claims that 46 villages in Nan, Luang Prabang and Chompet Districts of Luang Prabang Province, and Xayaburi District of Xayaburi Province will be impacted (see Table 4.1-1). These are

villages apparently situated at or below 278 masl¹⁰. The table suggests that 458 households will need to be physically relocated as a result of the dam and reservoir, while 3,582 households will lose land, property and income to the reservoir, construction areas or access road. The table does not specify the number of individuals who will have to be resettled, nor does it give any indication of the proportion of households in each village that will lose land or property to the dam project. No account of land or property lost to the power transmission system is given. In other words, important details are very sparse.

Table 4.2-1 on p.4-34 contradicts this earlier data by suggesting that in fact, 494 households will need to be relocated. 10 villages will have to be relocated, while another 19 villages are predicted to lose land to the project, mostly due to inundation by the reservoir.

Timeframe of study

From information provided on p.4-7 (“Socio-economic conditions of villages”), it appears that the entire field survey was conducted over a total period of 22 days only. Of this time, it appears only four days were spent on a household-level survey (p. 4-34). This is clearly insufficient time to accurately gauge the socio-economic conditions within the 46 villages it recognises as being impacted, never mind the vast number of Mekong villages upstream and downstream and the wider impact zones not yet recognised as being potentially impacted by the project. As a result, the SIA provides no more than a thumbnail sketch of the villages and households that it claims to have studied, and much of the information was contradictory with the EIA or largely irrelevant for the purposes of the SIA.

What was studied and considered important by the survey?

While the village sketches provided some information regarding socio-cultural issues, they were less detailed or specific at disaggregating the village populations and giving any real sense of which households were most vulnerable to socio-economic impacts from the dam project, how they would be impacted and why. The socio-economic information given was of a general nature and rather superficial, which perhaps is not surprising, given the short timeframe used in collecting it. The fisheries and aquatic resources aspect, which surely is the most important to focus on given the anticipated impacts from the dam, was particularly lacking in detail and poorly presented. Importantly too, there was no disaggregation of ethnic groups, beyond the very coarse constructions of Lao Loum, Lao Theung and Lao Soung, reinforcing an impression that the SIA team were poorly qualified to be conducting this kind of social research.

At the household survey level (Section 4.2), the vast majority of the people interviewed were male (74.9%) and heads of household (75.9%), meaning that relatively few women were interviewed.

¹⁰ Table 4.1-1 rather confusingly talks about villages “categorized by impact (at 275 msl and freeboard 275-278 msl)”, but does not specify the exact altitude of each village and the proportion of houses or land lying below 278 masl. The maps showing inundation zones (Chapter 5) only show land flooded below 275 masl. Elsewhere in the EIA, the report mentions land below 280 masl being impacted by raised water levels in the wet season. This discrepancy in heights should be explained by the project developers.

Most of the SIA is comprised of the results of a conventional questionnaire approach to data collection, with very little qualitative data provided. It is interesting to note that 64.2 % of households claimed to be involved in fishing, with a reported average catch of approximately 180 kg/hh/year, well above the national average in Lao PDR.

What is the level of awareness about the Xayaburi Hydropower Project?

Data presented on p.4-42 (“Information Perception and Attitude Towards the Project”), suggests that about 60 % of people interviewed had heard about the project, and 40 % were totally unaware of the plan. Despite this high level of unawareness, the survey still found that a reported 82.6 % of the respondents were in favour of the project, and only 2 % disagreed with it, while the rest were either not sure or declined to comment. These figures are perhaps not surprising, given the strong central state support for this project proceeding, the reluctance of people to contradict state policy and the widespread low level of awareness about the impacts of hydropower dams in Lao PDR generally. After all, most people have never seen a dam, much less experienced its impacts directly. In fact, all the results of the survey presented can be viewed in the light of the above observations and treated with a degree of scepticism of whether people are answering the questions from a position of knowledge or not. The comments attributed to provincial state officials in Xayaburi and Luang Prabang also strongly suggested that they were not aware of the nature and extent of impacts to be expected, and the implication of those impacts on the socio-economy of the region.

How objective or neutral was the SIA?

The objectivity of the SIA survey team is called into question by the frank admission in the report that they were actively working for the project developer at public consultations about the project resettlement program to “develop the understanding, positive attitude and cooperative [sic] of local people toward the project.” Patently, TEAM consultants were not in the field to neutrally or scientifically assess the likely impacts of the Xayaburi Hydropower Project on local communities, but were paid to sell the project to the villagers, which no doubt they were glad to do. Furthermore, it is also obvious from the data presented in the SIA that they spent more time consulting with government officials and state representatives at village level, than they did with ordinary villagers or PAPs (Project Affected Persons). With the dam apparently being government policy before the assessments were conducted, it raises awkward questions about the likelihood of people feeling free to express concerns in any so-called “public consultation”. Finally, this lack of neutrality and objectivity brings into question the veracity and reliability of the whole EIA and SIA process.

What are the SIA’s conclusions about impacts to fisheries livelihoods?

The SIA team conclude that “the project development will generate more fertile recourses [sic] in Mekong River” (p.5-16), but because the water level will be higher than at present, all the fishers

need to do is adjust their gear and methods to fish in deeper water and they will be able to carry on catching fish like before. They even claim that there may be more fish, as the developers will implement a fish breeding and release programme, and then train the villagers to be better fishers to take advantage of the higher yields possible. Note the number of people impacted is not counted, as it believes they will benefit, not lose from the dam. (Refer to comments made elsewhere on the inadequacy of the EIA fishery and aquatic ecology assessment and findings of the SEA fishery component to understand why this belief of the SIA consultants is false and misleading).

How does the SIA propose to compensate for lost or negatively impacted livelihoods?

The compensation and mitigation measures proposed for villagers who lose land and productive agro-ecosystems to construction and operation of the dam is that they can be compensated for crops lost (not apparent for how many years this will be provided) and the vegetable gardens can simply be moved higher up the riverbanks and provided with pumped irrigation water out the Mekong. Farmland will be replaced with “equally productive land” and they will be supported with “income restoration programmes”. This is an extremely poor version of a standard response by dam developers in the region, who believe that it is as an easy matter to just relocate whole villages, replace lost land with an equivalent parcel somewhere else and expect income restoration programmes to work in accordance with simplistic plans made by unaccountable and distant consultants. The reality is always more complex, and so little thought seems to have been devoted to this component, that it seems almost unbelievable that the EIA has progressed to this stage. For the access roads and transmission line corridor, the EIA believes minimum mitigation measures are needed during the construction period and not at all after construction has finished. No recognition of the rights of the villagers to full and fair compensation for lost land and production systems is given. No recognition is given of the fact that it would be impossible to replace riverbank gardens with something equally productive further up the river slope profile or what kind of impacts extra pressure on land elsewhere would create. The experience at other dam projects in Lao PDR, such as the Theun-Hinboun Hydropower Project, of trying to restore lost riverbank gardens through replacement gardens or supporting dry season rice cultivation has not been successful in most instances. Along the Nam Hai and Nam Hinboun rivers, many replacement gardens were abandoned after a few years, with villagers complaining about flood damage, low productivity, expensive water pumping costs, increased debts and limited markets. Who would be responsible for pumping an increased input costs for agriculture at the Xayaburi dam project is not made explicit. No sense of the practical or legal obstacles that would need to be overcome before such a move could succeed, or the ill-feeling that might result from poorly executed resettlement. Also, the lack of quantification and clarity surrounding the level of social and environmental impacts *in toto*, leaves one with little confidence that the EIA authors even have a simple grasp on implications of the issue.

The SIA assumes that there are only 1,547 households in total who will lose their livelihoods as a result of the dam. These it proposes (p.6-2), “to compensate for the lose [sic] income by appropriate livelihood restoration assistance programs such as provision of new job opportunities which generate income equal to the existing career, vocational training will also be provided for these PAPs”. In other words, there will be no cash compensation paid, unlike the situation in Thailand where, for example villagers were paid for loss of fishery and riverbank garden income following the

construction of the Pak Mun Dam. Unfortunately, the record of livelihood restoration programmes in Laos has been rather poor to date, with many unsolved problems and issues at dam projects such as Nam Leuk, Nam Theun 2 and Theun-Hinboun (see International Rivers, 2008). The livelihood restoration programme proposed in Section 6.1.3 (p. 6-4) seems destined to repeat the old mistakes, is limited in scope and does not take into account the challenges posed by such an operation. The same could be noted for the proposed Monitoring Program (p.6-5), although it does at least call for external, independent monitoring of the program implementation and impacts.

For lost paddy land, cropland or tree plantations (e.g. teak), the SIA proposes providing land for land as the preferred option, not cash at market value, without addressing where such land could be found of a similar quality to the original or whether, indeed, this was the preferred option of the affected households, from transparent consultations and negotiations. Given the obstacles to finding quality, unutilised land in the general vicinity of the project which is mountainous and forested mostly, frankly, this is likely to be an unsatisfactory solution to the problem and may well create new, unanticipated problems, as opposed to fair monetary compensation, where villagers can decide what they want to do with the money. The same principle might be true for compensating for lost and damaged fishery livelihoods, where there is no equivalent alternative.

Major gaps and deficiencies in EIA/SIA

This section raises further gaps, weaknesses and deficiencies in the EIA and SIA reports, not identified above concerning links with livelihoods.

Fisheries and Aquatic Ecology

- Extremely limited and incomplete data from local fishers, both qualitatively and quantitatively. Some incorrect factual information (e.g. listing *Cyprinus carpio* as migratory species in table 4.2.1-1). Data provided of virtually no use at all to make any decision for this project due to lack of catch breakdowns by season, month, method, gear, household, etc. Limited socio-economic data for decision-making purposes provided at individual, household, village, district or higher organisational levels. No fish consumption or nutritional study. No market or commodity chain analysis¹¹. No detail on fish processing and ancillary businesses related to fishing as an activity e.g. sale of fishing gear or salt for processing. No consideration of alternative livelihood options.
- Uses very limited and outdated secondary data sources and apparently has not scoped the wide body of literature on the subject of Mekong fisheries, from bodies such as MRC and WorldFish, that might give the EIA at least a scrap of credibility. As it stands, one can conclude that not only do the authors have a very poor factual understanding of the topic they have been tasked to study and that they apparently are poorly qualified in this field, but that they have taken very little effort in trying to expand their knowledge base, either from

¹¹ For example, when I worked in Xayaburi Province between 1997-99, I witnessed an active trade in Mekong river fish being sold to markets in Loei province, Thailand, transported by both boat and vehicle, while cheap Thai farmed fish species (e.g. tilapia and catfish) returned the other way to Lao markets.

secondary sources or directly from local fishers and resource users. This is frankly the worst fishery section of any EIA that I have had the opportunity to read.

Forest Resources

- Uses methods of assessing forest resources taught in Thai forestry schools that were considered appropriate for commercial, state-managed forestry management in the past, where forests are only regarded as valuable in terms of their sawn timber and stump value. But these are inappropriate and of little value in trying to assess livelihood values of forest resources to local communities and households, especially for riverine wetlands communities like those to be impacted by the Xayaburi Dam, where it is the functional value of ecosystem services that matters.
- Simplistically assumes that forests are only important to communities in terms of their standing timber, and fails to assess their wider values to other parts of the ecosystem, either locally or at a wider basin or regional level. Therefore, it mistakenly assumes minor impacts from losses of just 5 km² of forest (although, in reality forest losses will cover a much greater area than this, when the construction camp area and transmission line corridor are included).

Land Use & Agriculture

- Detailed, village by village breakdown of land that may be affected, number of households impacted, land type, land value, land tenure regime, food security issues and other relevant socio-economic data is absent.
- Customary usage, common property regimes and land use rights of villages, focusing especially on cultural and traditional aspects, overlooked. Identification and implications of loss or impairment of access and rights to land, on a village basis, during and after dam construction not considered.
- Clear information on village public and private infrastructure that will be impacted and estimated values missing.
- Impact of elevated water levels on riverbank gardens, livestock raising, collection of wild vegetables, etc not considered
- Threats to and impacts on household and village domestic water supplies are not investigated or quantified. Experiences at several other dam sites in Laos (e.g. Theun-Hinboun and Nam Theun 2) show that both surface and groundwater supplies traditionally used by villagers are often negatively impacted by hydrological changes brought by dams.

Mineral Resources

- A thorough survey is required of the entire reservoir area and downstream for perhaps several hundred kilometres (i.e. to beyond the Thai border in Loei province) of within-channel mineral resource extraction activities that will potentially be impacted by altered water level and flow regimes, both artisanal and commercial over an entire dry season

period, at the very minimum. The SEA estimates that almost 6,000 persons¹² live in the 100 kms stretch downstream of the dam, and would be vulnerable to the effects of peaking flows released from turbines. These extended impact zone surveys can then be documented as baseline data against any impacts that may later be claimed by impacted households and commercial operations. Especially important, because of the poverty aspect, are the activities of local people who pan for gold in river alluvium and might be very hard hit in any curtailment of this livelihood activity. But there are also larger sand, gravel and rock extraction businesses, which employ local people that might have to cease or restrict future activity following dam construction that should be surveyed and recorded.

Aesthetic / Tourism / Archaeology

- Very scant, data-deficient information provided, from which it is impossible to get a good sense of the scale and extent of impacts. There are definite risks that a more regulated river, with degraded natural habitats, less biodiversity and cultural diversity will have less eco-tourism potential than at present.
- There appears to be a clear need for a full, impartial and transparent survey of historical, religious, cultural and archaeological sites along this stretch of river between Pak Lay and above Luang Prabang to be carried out, to ascertain the potential impacts of the Xayaburi Dam project on these aspects and how they might impact local society, culture and livelihoods. The existing information is inadequate. Of particular concern would be the loss of common and traditional lands (such as the inundation of Luang Prabang's New Year's Festival beach by the Mekong) with spiritual, cultural and economic importance to many.

Livelihood Restoration Programme

- The main component stressed by the program is a so-called "Food Source Reserved Development Program" (Section 6.1.3), which it also refers to as a 'food bank' project. Conserving remaining forests and stocking native fish in the river are suggested. Whilst this might seem like a potentially good idea for adoption in a conventional rural development project, it raises serious questions about whether such an idea would be feasible for people who have lost a major part of their main means of sustenance and livelihood i.e. fish and aquatic products from the Mekong and to a lesser extent, NTFPs and agricultural production land. It also seems to inherently assume that local people themselves are the underlying culprits of resource degradation, rather than considering the role of outside agents too. The experience at other regional dams is that the impacts do not fall equally on all households, and some are clearly more vulnerable than others to food security and income losses, so any livelihood restoration component that has a time lag before becoming operational (e.g. like waiting for trees to mature) or without a clear target focus on the most heavily impacted households is likely to fall short of addressing

¹² See p.75, Fig 27 of SEA document.

real or felt needs. Far more thought and detail would need to go into this proposal, before it could be considered a viable mitigation strategy.

- The other ideas suggested by the program are rather standard for dam projects in Laos, but currently lack detail and do not go far enough in addressing the complex and multiple needs of villagers that have been dispossessed of both private and common property and suffering the trauma of relocation, which includes addressing their psychological needs, as well as livelihood needs. The SIA also does not mention whether the project intends to abide by the principle of impacted individuals and households being made no worse off from the project or better still, becoming beneficiaries through sharing in its profits, over and above their rights to full and fair compensation for losses suffered.
- There is also the nagging question about the hundreds (possibly more?) of villages heavily impacted by the dam post-construction, but not currently considered by the SIA or EIA. What provisions will be made for them, and is there going to be a contingency fund set up to cover these unforeseen affected people and the costs associated with compensating them for lost livelihoods or mitigating the impacts? The SIA is not clear how long the project developer intends to support a livelihoods restoration programme, beyond the life of the 6 year resettlement programme during project construction (see Table 3.2-1). Experience at other large dams suggests this may require a commitment by the developer lasting several decades or longer, given the lasting and often unforeseen impacts on livelihoods such projects precipitate.

General cross-sectoral deficiencies

- The EIA/SIA surveys took a clearly top-down approach to the methodology of ascertaining socio-economic impacts, relying too heavily on interviews with state officials and to a lesser extent, village headpersons, but with very little focus on the opinions and concerns of ordinary people who will be impacted by the dam. A different, more participatory approach would have allowed them to better document natural resource-based livelihoods, get a range of opinions and allow for a balanced view of the local society and particularly, the lives of those most vulnerable to impacts by the dam project.
- Methods used included rather out-dated, ill-designed and discredited tools for participatory research with diverse ethnic groups and assessing multi-component livelihoods, with heavy use of questionnaire surveys, non-participatory sampling techniques and attempts at inappropriate quantitative tools. This would suggest that the TEAM staff were not well-qualified to conduct such research and lacked appropriate experience for such an important and far-reaching trans-boundary impact project.
- The surveys do not specifically target or consider the livelihood activities of the poorest and most vulnerable sections of society, even though it is widely recognised that the burden and impacts of the mainstream dams would fall most heavily on the poorest. For example, the SEA estimates that nearly 40 % of households living in the Xayaburi Dam area experience food insecurity for over six months a year, but the impacts of the project on this group are not specifically considered and what their options might be in the event of a massive decline in available protein from wild caught riverine fish.

- Both documents are rather poorly written in terms of style, grammar and prose. Many sentences are nonsensical (e.g. “Production aspect is more development, farmer use more small plowing machine, about 500 units have been used or average 10 household/unit” – SIA, p.4-4). This is partly an issue of English language ability of authors, but beyond this factor, there appears to be a general lack of technical understanding concerning many of the issues they are writing about. In addition, there appears to be much verbatim repetition of information from official Lao provincial or district govt documents, without any ground-truthing verification or critical analysis that might give the document some balance or credibility. In many places figures and units given are clearly nonsense or contradictory to earlier data, which suggests that there has been little or no editorial oversight of the document before release.

Conclusions

The first major conclusion is that the EIA covers far too limited geographical scope to adequately document impacts that are widely expected to be felt for many hundreds of kilometres upstream and downstream. The dam has potentially serious transboundary impacts and implications extending downstream to Thailand, Cambodia and Vietnam, which are not considered in the EIA and SIA. At the very least, it should justify why it has limited its scope to such a narrow belt either side of the river and not also included communities not immediately next to the river, but who rely on it for fishing and other natural resources, that would be negatively impacted, both directly and indirectly. There are also many potential impacttees along the line of the power transmission line and access roads not adequately recognised to date. A recent report estimates that about 202,000 people will be directly impacted by the dam project (International Rivers, 2011), compared to the 4,040 households presently recognised as being PAPs in the SIA. The second major conclusion is that the EIA vastly underestimates the scale and magnitude of the impacts, in all sectors, but especially the fisheries and aquatic resources component, which is of such fundamental importance to the food security and livelihoods of over two million people living along the mainstream Mekong (ICEM, 2010). The temporal aspects of the project are downplayed, and there is a reluctance to recognise the likelihood of widespread and on-going socio-ecological impacts occurring during the construction phase and well into the operational period too. Throughout, both documents lack rigorous detail of present livelihoods, the nature of project impacts and future options for livelihood compensation and mitigation. (Refer to Annex 1 to see a summary of impacts predicted in the EIA conclusions).

Both project documents display a poor understanding of the far-reaching environmental and social impacts of the Xayaburi Hydropower Project on livelihoods of impacted people. The field studies were carried out over a very limited time frame and empirical observations provided in the EIA and SIA are very superficial surrounding livelihood impacts. The EIA and SIA fail to acknowledge the opinions of international experts on likely impacts from the dam, in reports such as the SEA, or learn salient lessons from dams built in Thailand, such as the well-documented case of Pak Mun Dam in Northeast Thailand (e.g. Amornsakchai et al, 2000). It falls well short of guidelines recommended by the World Commission on Dams (2000) for social and environmental safeguards of dam impacts,

particularly in the areas of public participation, free and informed prior consent of all stakeholders and recognising entitlements and sharing benefits.

As they presently stand, the EIA and SIA reports are rather short-sighted, often factually incorrect and technically inadequate documents that fall short in their supposed task of investigating, predicting and analysing likely spatial and temporal project impacts on livelihoods of affected persons, and thus are in no position to recommend suitable mitigation and compensation measures. The entire process appears to have been conducted as a mere tick-box exercise, rather than with any serious intent to ascertain actual social and environmental impacts. At the same time, the consultants responsible for writing the EIA seem remarkably ill-qualified to conduct an EIA for a major mainstream dam project on such an important transboundary river system.

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ANNEX 1

Summary of overall impacts and perceived level of threat to the resources and livelihoods of people, expressed in table given in Conclusions (Section 8.1) of the EIA document (copied verbatim).

ASPECT	MAIN IMPACT	RESIDUAL* IMPACT LEVEL	LOCATION	PERIOD
Hydrology / Water Resource Management	Obstruction of waterway	Minor	Mekong River	Construction & Operation
Surface Water Quality	- Increasing of turbidity - Changing of BOD - Oil contamination	Moderate	Mekong River	Construction & Operation
Aquatic Ecology / Fishery	Reduced population of phytoplankton & benthic organism	Moderate	Mekong River	Construction
Forestry	Loss of forest area and forest ecology	Minor	Xayaburi Barrage	Construction
Wildlife	Disturbance of wildlife living	Minor	Xayaburi Barrage	Construction
Land Use / Agriculture	Changing of land use and agricultural pattern	Minor	Xayaburi Barrage	Construction & Operation
Public Health	Increase of disease and accidents	Minor	Xayaburi Barrage	Construction & Operation

Note *= Residual Impact Level are based on proper implementation of mitigation measures and Environmental Management Plan