Fatally Flawed Xayaburi EIA Fails to Uphold International Standards:

A Preliminary Review of the Environmental Impact Assessment (EIA) Report For the Xayaburi Hydropower Dam on the Mekong River mainstream in Northern Lao PDR

By: Ame Trandem, International Rivers[1]
14 March 2011

Introduction

The purpose of an Environmental Impact Assessment (EIA) is to help aid decision-making by providing an improved understanding of the costs and benefits of a project through the identification and technical analysis of the environmental consequences, while also demonstrating means to prevent, mitigate and off-set environmental deterioration. As an EIA should be based on technical analysis that is scientific, evidence-based, and neutral, public participation and information disclosure are essential to ensure a report's accuracy and credibility. However, as the Xayaburi EIA report was only released to the public in mid-March 2011, public scrutiny of the report's findings and recommendations have thus far been absent in the debate over whether or not to build the Xayaburi Dam, despite the fact that a decision is expected by 22nd April 2011.

This review is based on the report entitled *Environmental Impact Assessment for Xayaburi Hydroelectric Power Project in Lao PDR*. The August 2010 report was prepared by Thailand's TEAM Consulting Engineering and Management Co. LTD for the Thai dam-developer Ch. Karnchang Public Company Limited.

While this preliminary review is by no means comprehensive, the analysis reveals critical flaws in the EIA for the Xayaburi Dam, and demonstrates that some significant gaps must be addressed before regional governments are able to make an informed or responsible decision over whether or not to build the Xayaburi Dam.

A few of the most outstanding critical flaws and significant gaps of the EIA report are:

- Key technical information and analysis is lacking throughout the report, including on fisheries and aquatic resources, water hydrology, sediment transport, and dam safety in the event of earthquakes;
- As the report only considers a downstream area of 10 kilometers (EIA, 1-2), the Xayaburi Dam's transboundary and basin-wide impacts are not considered or acknowledged;
- The Xayaburi Dam is the first in a cascade of eleven large dams planned for the Mekong River's lower mainstream, yet the report does not provide any consideration

[1] Mekong Campaigner, International Rivers. Email: ame@internationalrivers.org

of the cumulative impacts that these dams may have or an analysis on how the combined operations of the dams may affect the operation and impact of the Xayaburi Dam.

According to international best practice, a key factor in the environmental impact assessment process is allowing for public involvement and consultation. The Xayaburi EIA's consultation process was restricted to 252 people located in the project site, less than 8% of the people who would be directly impacted by the project (Social Impact Assessment, 4-52). While international standards would require a transparent process that is open to people who would be both directly and indirectly affected by the project and would require key project documents to be disclosed to the public prior to consultation, the "consultation" for the Xayaburi Dam was a one-time event at the start of the EIA process in which nearly half of the participants had never even heard of the dam prior to the half-day meeting (SIA, 4-42). For the estimated 202,000 people who could be indirectly affected by the project, there has been no consultation at all.

As the EIA has only recently been disclosed to the public after its approval was already granted by the Government of Laos, and is known to be available only in the English language, one can safely assume the majority of the people who will be affected by the Xayaburi Dam are unaware of the EIA report and its findings and conclusions. **Given the EIA's serious shortcomings and the need for informed decision-making on the Xayaburi Dam - a dam that threatens the livelihoods and food security of millions of people in the region - the regional decision-making process should be halted until the EIA is redone in accordance with standards of international best practice and that reflects the transboundary nature and importance of the Mekong River.**

<u>Summary Assessment of Xayaburi EIA report</u>

Fisheries and Aquatic Resources:
While the Mekong River is host to the world's largest freshwater fishery, the EIA report makes no attempt to provide even the most basic baseline information on the river's fisheries and aquatic resources in terms of species, abundance, spawning sites, migration behaviors, and ecosystem needs. Instead the report recommends further studies, including studies to identify fish spawning areas and fish species composition, which would take approximately one year to complete (EIA, 3-38). The report also lacks fundamental information on dam operation plans and how its operation will impact hydrological flows. Without this necessary information, it's impossible to understand how changing environmental conditions will impact the fisheries' aquatic habitat and seasonal migration triggers.

In addition:

- The EIA states that Mekong Giant Catfish are not found in the project area nor are any other rare or internationally endangered species present (EIA, 5.2.1). However, this information is in direct contradiction to the MRC's Strategic Environmental Assessment (SEA) report which finds that mainstream dams proposed to be built on the Mekong River between Vientiane, Laos and Chiang Saen in Northern Thailand may threaten the extinction of at least 41 fish species, including the critically endangered and iconic Mekong Giant Catfish.
- While reservoir fisheries are mentioned as a possible form of mitigation for communities living within the reservoir inundation area, no direct measures are provided as to how fish losses will be mitigated or compensated for the hundreds of thousands riparian people living downstream and upstream of the dam who will be impacted. Furthermore, the EIA

fails to note that only certain fish species are likely to survive in the stagnant waters of the reservoir, nor does it mention how the reservoir fisheries will be managed, who will be permitted access to fish, and the fact that overall net fisheries losses are likely to occur.

- Impacts during the dam's construction phase have not been considered despite the fact that they are likely to cause significant environmental degradation and disrupt fish migration, which may result in losses in fish species biodiversity and abundance.
- Despite the EIA's massive inadequacies in terms of fisheries-related information, the project developer misleadingly and erroneously assumes that two pool-type fish ladder facilities will alleviate fisheries impacts (EIA, 5-12). This directly contradicts the region's pre-eminent fisheries experts who stated in September 2008 **that no technology exists to effectively mitigate the impacts to fisheries that would be caused by mainstream dam**s due to the Mekong River's large biodiversity and high number of fish[2]. The SEA report states that the height of the Xayaburi Dam of 32 meters is higher than the maximum height at which fish ladders will work.

Hydrology and Water Quality:
Claiming the Xayaburi Dam is a run-of-river dam, the EIA report has misleadingly stated that natural flow will be maintained and that impacts to the river's hydrology will be minimal (EIA, 5-3). As the EIA fails to adequately study the environmental flows of the river, including the river's temperature changes and flow volumes, amongst other factors, further studies are required to establish a baseline in order for the impact assessment to determine how changes in the river's flows and quality will affect the river's aquatic ecosystem. Furthermore, as the dam will create a 100 km long impoundment from the dam site up to Luang Prabang, this stretch of the river will change from the present fast moving river with important seasonal variations in water levels to a relatively stagnant river with a constant water level. Despite this significant change to the river's present state, the EIA has not assessed how this change is likely to adversely impact the river's productivity through harm to the river's ecosystem, flora and fauna caused by the permanent impoundment of riverbanks, sand bars and deep pools. The EIA has also failed to give adequate consideration of the dam's impacts to water quality. As the dam's construction phase may lead to water quality deterioration through oil, material and waste water pollution and the dam's impoundment may lead to potential anoxic conditions and algae blooms, the health of the river's ecosystem and people may be at risk due to poor water quality and subsequent water related illnesses.

Furthermore, the EIA provides no information on the dam's operation rules. Until the project developer provides all information on how it guarantees to ensure natural flows throughout the year, the river's hydrology could be at significant risk along with river's ecosystems that depend on it.

Sedimentation:
While the Mekong River's fertile sediment load is known to be important to the region's fisheries and rich agricultural productivity, including for riverbank gardens found along the river's entire length and Cambodia's Tonle Sap Lake and Vietnam's Mekong Delta, the EIA report fails to even consider the dam's impacts to sediment movements. While the MRC's SEA report documents that dam development in the upper stretch of the Mekong River's lower mainstream will result in changes in sediment flows, the EIA report fails to consider impacts to sediment properties, size distributions, loads, and the sources of different types of sediment. Instead, the EIA report only considers the impacts from sediment deposits in the study area and considers

[2] See http://www.mrcmekong.org/catch-culture/vol14_3dec08/mainstream-dams-barriers.htm

how reduction in sediment transportation may result in accelerating erosion problems and riverbank instability for only 10 km downstream of the dam.

While the Xayaburi Dam's feasibility and EIA studies provide sediment passages and sand flushing facilities as a form of mitigation (EIA, 6-6), basic sediment considerations and the technology's effectiveness remains unverified, along with a full understanding of the dam's potential scale of impact. As a result, the EIA fails to consider the significant impacts likely to occur on agricultural, fisheries and the aquatic ecosystem as a result of changes to sediment movements.

Dam Safety and Earthquakes:
The EIA refers to research conducted in 1997 in northern Thailand and northwestern Laos to assess the risks associated with an active fault-line located near the dam site, which is reported to experience Richter Local Magnitude (ML) level 5 earthquakes at around seven-year intervals (EIA, 4-66). However, the EIA only relies on secondary research and does not carry out its own seismology risk study on how the dam may potentially trigger or be impacted by earthquakes. Despite this, the EIA report concludes "there is a relatively low probability of the Xayaburi Hydroelectric Power Project area being affected by a major earthquake, however, the project development can incorporate appropriate safety design factors for seismicity" (EIA, 4-69). However, the report later states that "mitigation measures for the project development during construction and operation periods are regarded unnecessary" (EIA, 6-8).

In addition, the dam's feasibility study admits that dam safety aspects have not been fully incorporated into the design of the project and recommends that "In next stage of the study, outline design and detailed design, barrage and appurtenant structure will be studied and designed in compliance with Guideline of International Commission on Large Dams (ICOLD) and World Bank" (FEA, 1.9).

Given the serious risks associated with large dams experiencing earthquakes either through dam bursts or by triggering earthquakes due to reservoir-induced seismicity, the EIA has failed to demonstrate that it upholds the highest standards of safety.

The feasibility study and EIA report have also failed to comply with the MRC's Preliminary Design Guidance (PDG) for Proposed Dams, which were endorsed by the MRC's Joint Committee in 2009, in order to ensure that the dam's safety design, construction and operation are in the interest of all MRC countries. While the EIA states that the PDG provisions on dam safety will be followed, one important PDG requirement that the Xayaburi Dam's project developer has failed to comply with is the establishment of an Independent Dam Safety Review Panel that would oversea the investigation, design and construction of the dam and the start of operations.

References:

Feasibility Study of Xayaburi Hydroelectric Power Project Lao PDR Final Report. Prepared by Team Consulting Engineering and Management Co. Ltd. and Colenco Power Engineering Ltd. for Ch. Karnchang Public Company Limited. March 2010. (http://www.xayaburi.com/bookflip.html)

Final Report Environment Impact Assessment of Xayaburi Hydroelectric Power Project Lao PDR. Prepared by Team Consulting Engineering and Management Co. Ltd. for Ch. Karnchang Public Company Limited. August 2010.

Preliminary Design Guidance for Proposed Mainstream Dams in the Lower Mekong Basin. Mekong River Commission. 31 August 2009. (See: http://www.mrcmekong.org/pnpca/Preliminary-DG-of-LMB-Mainstream-dams-FinalVersion-Sept09.pdf)

Social Impact Assessment of Xayaburi Hydroelectric Power Project Lao PDR. Prepared by Team Consulting Engineering and Management Co. Ltd. for Ch. Karnchang Public Company Limited. August 2010.

Strategic Environmental Impact Assessment of Hydropower on the Mekong Mainstream. Prepared by International Centre for Environmental Management for Mekong River Commission. October 2010. (See: http://www.mrcmekong.org/ish/SEA/SEA-Main-Final-Report.pdf)