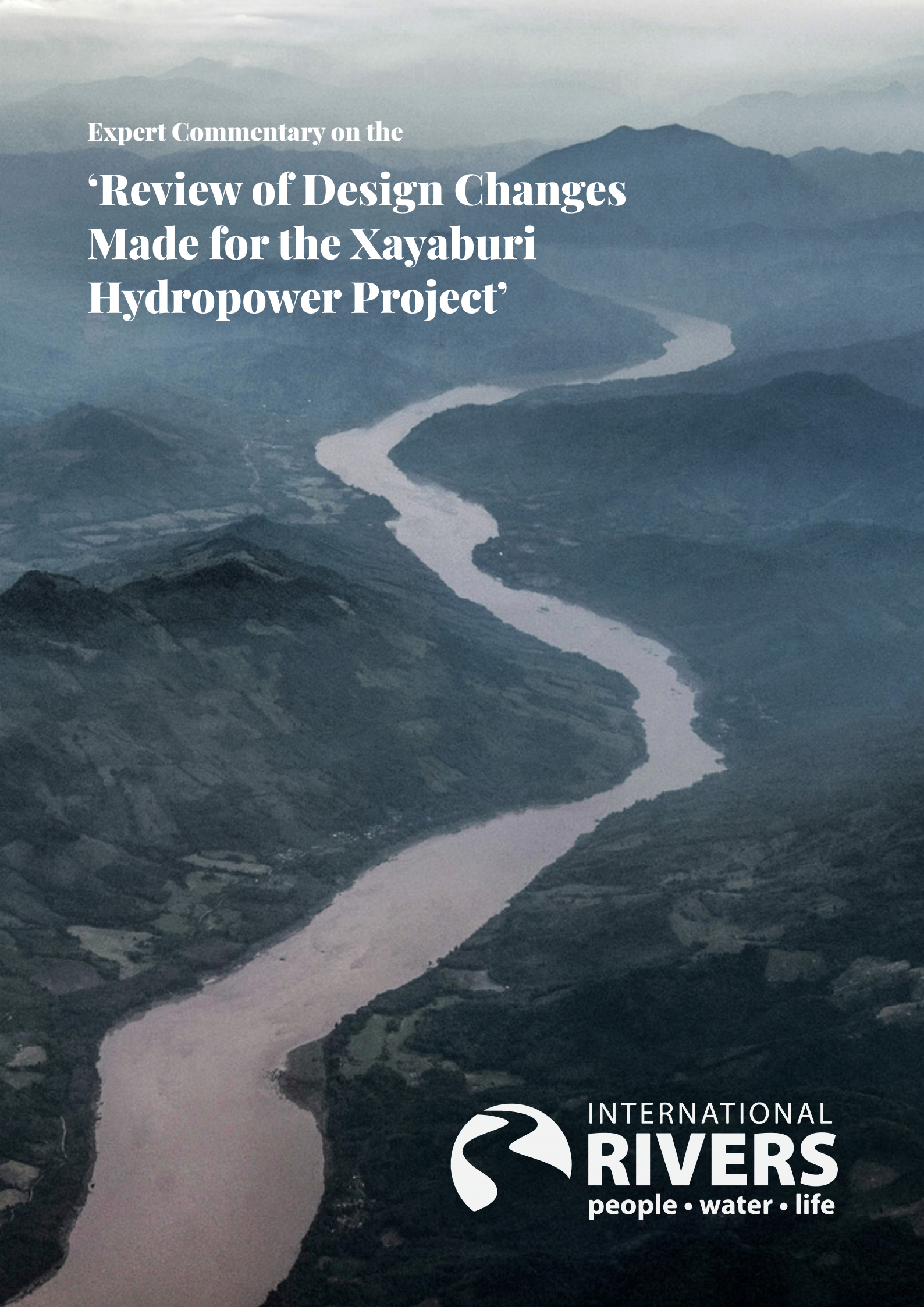

Expert Commentary on the

‘Review of Design Changes Made for the Xayaburi Hydropower Project’

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Introduction

In In this report, International Rivers commissioned two experts to provide comments on the Mekong River Commission's 'Review of Design Changes Made for the Xayaburi Hydropower Project'[1] (the 'MRC Review'), which was released in early 2019.

> **From the outset, the Xayaburi dam was a highly controversial project due to widespread concerns over its expected impacts on the river system, including transboundary impacts in neighboring countries.**

The MRC Review examines information provided by the Government of Laos and the project developer about the redesign of the Xayaburi Hydropower Project. The MRC Review assessed this information against the findings and recommendations of the MRC's original Xayaburi Technical Review Report (TRR),[2] which was produced by the MRC during the Xayaburi Prior Consultation process.

This expert commentary is not intended as a critique or assessment of the MRC Review. Rather, it seeks to draw out key points and discuss their implications for Xayaburi and other dams under construction or consideration on the lower Mekong mainstream and within the region. The objectives of this commentary are to:

- Highlight some important findings and statements noted in the MRC Review;
- Provide reflections on the implications of the MRC Review for the Xayaburi dam and other hydropower projects on the lower Mekong mainstream and within the region that are referencing Xayaburi as a benchmark or model;
- Provide reflections on the implications of the MRC Review for the MRC's procedures, regional decision-making and related initiatives that are discussed in the review as potentially helping to address the gaps and challenges identified with Xayaburi.

[1] MRC (2019). *Review of the Design Changes Made for Xayaburi Hydropower Project.* Technical Reference Paper No. 65, January. <http://www.mrcmekong.org/assets/Publications/Review-of-the-design-change-made-for-Xayaburi-hydropower-project_technical-ref-paper_2019.pdf>. See also MRC Presentation on the review of the redesign: <http://www.mrcmekong.org/assets/Uploads/4.-Xayaburi-Design-Changes.-140918.pdf>.

[2] MRC (2011). *Proposed Xayaburi Dam Project: MRCS Prior Consultation Project Review Report.* <http://www.mrcmekong.org/assets/Publications/Reports/PC-Proj-Review-Report-Xaiyaburi-24-3-11.pdf>.

Photo: Jittrapon Kaicom

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Dr Oliver Hensengerth is an associate professor at Northumbria University in Newcastle, UK. He works on transboundary water governance, water-food-energy-nexus, and the politics of decision-making. Oliver is a co-investigator in two current projects: The project "Living Deltas", funded by the UK's Global Challenges Research Fund, explores the future social and ecological sustainability of major river deltas in Vietnam, India and Bangladesh; and the Newton-NERC project "Viet Nam: Slow Onset Hazard Interactions with Enhanced Drought and Flood Extremes in an At-Risk Mega-Delta" investigates the resilience of food production in the Mekong Delta under conditions of rapid social and environmental change.

Development of the Xayaburi Hydropower Project

The Xayaburi Hydropower Project, located in Lao PDR, was the first hydropower dam on the lower Mekong mainstream to begin planning and development. The Xayaburi project commenced the Mekong River Commission's (MRC) Prior Consultation process in October 2010.[3] Prior Consultation is required for proposed Mekong mainstream dam projects under the MRC's Procedures for Notification, Prior Consultation and Agreement (PNPCA). Prior Consultation takes place over a minimum period of six-months, and must be completed before construction of the dam is initiated.[4]

From the outset, the Xayaburi dam was a highly controversial project due to widespread concerns over its expected impacts on the river system, including transboundary impacts in neighboring countries. The project's major predicted environmental impacts include the destruction of Mekong migratory fisheries and trapping of sediment, preventing it from traveling downstream. The dam's environmental impacts in turn threaten the food, livelihoods and socio-cultural systems of populations residing within the river basin.

As the first project on the lower Mekong mainstream, amid plans for a total of eleven lower mainstream dams, the decision-making process for Xayaburi had potential to determine the standard for decision-making and the issues for consideration with respect to later mainstream hydropower projects.

During the Xayaburi Prior Consultation, many stakeholders raised concerns over the project and questioned the adequacy of the data and studies used to inform decisions about the project's impacts and whether it should be built. Following the six-month Prior Consultation, the lower Mekong governments were unable to reach an agreement on whether and how to proceed with the Xayaburi dam. The Vietnamese government[5] called for a suspension of Xayaburi and a ten-year moratorium on all mainstream dams pending further studies to better understand the river system and the impacts of proposed dam projects. The Cambodian government also expressed serious concerns and called for additional studies.[6]

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[3] MRC (2010). *Xayaburi Hydropower Project Prior Consultation Process.* <http://www.mrcmekong.org/topics/pnpca-prior-consultation/xayaburi-hydropower-project-prior-consultation-process/>.

[4] 5.4.3 of PNPCA states that "The notifying State(s) shall not implement the proposed use without providing the opportunity of the other Member States to discuss and evaluate the proposed use."

[5] Viet Nam National Mekong Committee (2011). *Form for Reply for Prior Consultation: Xayaburi Hydropower Project*. <http://www.mrcmekong.org/assets/Consultations/2010-Xayaburi/Viet-Nam-Reply-Form.pdf>.

[6] Radio Free Asia, 'Vietnam Joins Cambodia on Xayaburi Opposition', 6 July 2012.

Xayaburi Dam

Location	Mekong River, Xayaburi province, about 80 km south of Luang Prabang
Installed Capacity	1,285 MW
Market	Around 95% of electricity exported to Thailand, with remainder for Laos.
Developer	Xayaburi Power Company Limited (XPCL)
Financiers	Siam Commercial Bank (SCB), Bangkok Bank (BBL), Krung Thai Bank (KTB), Kasikornbank (KBank), TISCO Bank and the Export-Import Bank of Thailand
Project development	• MOU signed May 2007 • Project Development Agreement (PDA) signed November 2008 • Prior Consultation process formally started October 2010 • Concession Agreement signed October 2010 • Power Purchase Agreement signed October 2011 • Construction began 2012 • Commercial Operation October 2019

Following the six-month Prior Consultation, the lower Mekong governments were unable to reach an agreement on whether and how to proceed with the Xayaburi dam.

Despite the disagreement, the Government of Laos (GoL) pushed ahead with development of Xayaburi, with the project developers announcing a redesign of the dam and additional investment in impact mitigation measures in order to address concerns. The redesign of the Xayaburi dam, in which the project developers reportedly invested an additional $400 million USD, included:

- Additional fish passage facilities and modifications to the original fish passage design;
- Additional navigation facilities;
- Sediment transport facilities, notably low-level gates to facilitate sediment flushing; and
- Studies to investigate seismic risk.

Despite the announcements by the GoL and the project developers of the additional investment in impact mitigation, very little information was made public regarding the nature and extent of additional studies undertaken and design changes made to the project. This was in spite of repeated calls and requests by Mekong communities, members of the public, and MRC Developments Partners to release information regarding the design changes and enable review by the MRC Secretariat for compliance with its 'Preliminary Design Guidance for Mekong Mainstream Dams' (PDG) as well as independent scrutiny. In the meantime, construction of the project moved ahead and is expected to commence full operations in October 2019.

In addition to the redesign, the Xayaburi Prior Consultation process also helped prompt a number of additional studies as well as updates to the MRC's suite of guidelines. One of the most notable of these was the MRC's Council Study, published in 2018.[7] The MRC Council commissioned this study following the inability of member states to find a common position during the initial Xayaburi Prior Consultation process. The study examines the cumulative impacts of planned developments within the lower Mekong basin including the lower Mekong mainstream dams.[8]

[7] A snapshot of the MRC Council Study findings and recommendations and links to the reports are available at: <http://interactive.mrcmekong.org/council-study-findings/council-study-findings/>.

[8] International Rivers (2019). *Tragic Trade-offs: The MRC Council Study and the Impacts of Hydropower Development on the Mekong.* <https://www.internationalrivers.org/resources/tragic-trade-offs-the-mrc-council-study-and-the-impacts-of-hydropower-development-on-the>.

The MRC Review

In January 2019, the MRC published a 'Review of Design Changes Made for the Xayaburi Hydropower Project'[9] (the 'MRC Review'). In particular, the MRC Review assesses the submitted information against the findings and recommendations of the Xayaburi Technical Review Report (TRR)[10] that was produced by the MRC during the Xayaburi Prior Consultation.

The MRC Review is based on information provided by the GoL and the project developer regarding the redesign during the project construction process. This includes information on the redesign that was provided to the MRC but has not been publicly released, as well as copies of PowerPoint presentations on Xayaburi design changes delivered at a GoL-hosted workshop on Xayaburi dam in July 2015.

The MRC Review finds a number of shortcomings in the redesign information, both in terms of the adequacy of the mitigation measures themselves, as well as the comprehensiveness of the data provided to the review team in order to assess such adequacy.

A particular concern expressed throughout the MRC Review findings is that, without information on the operational rules of the dam, it is not possible to assess the adequacy of the redesign measures. The operational rules are governed in part by the project Concession Agreement (CA) and Power Purchase Agreement (PPA).

> **Because these project documents are considered commercial in nature and are not publicly available, lack of access to this information means that it is not possible to assess the scope for operational flexibility and adaptability in response to findings from ongoing monitoring of sediment, fisheries, hydrological and other impacts of the dam.**

In addition, as noted in the MRC Review, key issues and concerns raised during the Prior Consultation and in the TRR, including concerns related to the social and livelihoods impacts of the project and its transboundary impacts, were not addressed or were inadequately addressed in the redesign and in the additional information provided by the project developers.

[9] MRC (2019). *Review of the Design Changes Made for Xayaburi Hydropower Project.* Technical Reference Paper No. 65, January. <http://www.mrcmekong.org/assets/Publications/Review-of-the-design-change-made-for-Xayaburi-hydropower-project_technical-ref-paper_2019.pdf>. See also MRC Presentation on the review of the redesign: <http://www.mrcmekong.org/assets/Uploads/4.-Xayaburi-Design-Changes.-140918.pdf>.

[10] MRC (2011). *Proposed Xayaburi Dam Project: MRCS Prior Consultation Project Review Report.* <http://www.mrcmekong.org/assets/Publications/Reports/PC-Proj-Review-Report-Xaiyaburi-24-3-11.pdf>.

Photo: Jittrapon Kaicom

The MRC Review seeks to address the following questions:

a) Is **sufficient detailed information** provided to describe how the recommendations of the Xayaburi TRR have been considered in the revised design of the project?
b) Does the documentation provide **sufficient evidence that the revised design addresses the recommendations of the Xayaburi TRR,** and allay the concerns raised during the prior consultation process?
c) Is sufficient information provided to **establish the record of the proposed use, and the record of the proposed use once commenced** (PNPCA Article 5.4.3)?"

The findings of the MRC Review in relation to these questions are mixed. The overall findings and conclusions are summarized in the following paragraphs:

> *"In conclusion, the developer has made significant efforts and investments towards addressing the concerns raised in the Xayaburi TRR. However, insufficient information has been provided to fully assess the likely efficacy of these measures. As the revised operating rules have not been provided, there is insufficient information to establish the record of the proposed use once commenced for the purposes of the Procedures for Water Use Monitoring.*

Ongoing interaction throughout the re-design process are likely to have led to a more effective design and would have built further confidence in the outcomesin all the Member Countries. Monitoring through the Joint Environmental Monitoring (JEM) and adaptive management will be required to further optimise the design as far as is provided for in the Power Purchase and Concession Agreements.

In the longer term, earlier engagement of potential mitigation measures in the project development cycle and in the Business Case for future HPP will be required to ensure the economic viability of any mitigation measures. Moreover, regional strategies across the water-food-energy nexus will be required to comprehensively address sustainable development of the Mekong River Basin"

...key issues and concerns raised during the Prior Consultation and in the TRR, including concerns related to the social and livelihoods impacts of the project and its transboundary impacts, were not addressed or were inadequately addressed in the redesign..."

Photo:
Supthep Kritsanawarin

The MRC Review and the Xayaburi dam as 'benchmark'

Emeritus Professor Philip Hirsch

The MRC Review considered several key areas in which adaptations to the design of the Xayaburi dam were made in response to the TRR and comments received during the Prior Consultation process. It relied substantially on information provided by the project developers. This commentary focuses on two critical impact mitigation areas (fisheries and sediment passage). For each, three key concerns are considered: effectiveness of the redesign in achieving mitigation objectives; the adequacy of the data presented by the developers to allow the MRC review team to assess the likely effectiveness of the redesign measures; and the implications for monitoring and operating rules of the dam.

Fish passage

The main fish passage measures described in the redesign information are as follows:

- A redesigned vertical slot fishway on the left bank of the dam, leading to two dedicated fish locks
- Provision for installation of a fish lift, should the fish locks prove inadequate
- Redesigned entrances to attract fish into the chamber leading to the fish pass
- Provision for navigation lock operation to serve as a secondary fish migration route on the right bank
- "Fish friendly turbines" that reduce the number of turbine blades from six to five
- An upstream barrier screen to prevent larger fish from being sucked into the turbines
- Studies of the requirements of several species to allow for appropriate entrance provision at different levels of the water column
- Studies of the swimming capacity of several species to assess the adequacy of the vertical slot fish passage design

i) Redesign effectiveness

The MRC Review reveals a number of ongoing concerns regarding effectiveness of the fish pass. It notes that nowhere in the world have these measures been tested or monitored. Xayaburi is thus in effect being used as an **experimental test case,** which contravenes the fifth and final recommendation of the 2010 MRC-initiated Strategic Environmental Assessment of Hydropower on the Mekong Mainstream, which states that: **"The Mekong mainstream should never be used as a test case for proving and improving full dam hydropower technologies."**[11]

[11] ICEM (2010). *MRC Strategic Environmental Assessment (SEA) of hydropower on the Mekong mainstream,* p. 24. < http://www.mrcmekong.org/assets/Publications/Consultations/SEA-Hydropower/SEA-Main-Final-Report.pdf>.

Among the concerns over the likely effectiveness of the fish passage provisions are:

- For upstream migration, the vertical locks' ability to cope with the very large volumes of fish passing during peak migration (during March to May in particular)is questionable. There is therefore a high risk that fish will congregate at the top of the fish pass at a rate higher than the ability of the locks to raise them the remaining distance above the dam.
- There are ongoing but unaddressed concerns over predation (fish being attacked by predators) as multiple spcies are forced together in the constrained area of the fish pass.
- The redesign has not accounted for fish passage at different spillway flow levels, only for high flows.
- For downstream migration, there is little information provided on the likely impact of the passage of fish larvae through the turbines. Larval drift is just as important in the migratory fish life cycle as upstream swimming.
- There is concern that the fish screens above the dam could impinge (or strike) larger fish, so that although they would not be sucked through the turbines, they would still suffer high levels of mortality.
- The "fish friendly turbine" redesign has gone some way to reducing the likely impact of fish strikes as fish pass through, but the barotrauma (or pressure effect when fish pass rapidly through different water pressures produced by the dam) has not been addressed with regard to fish mortality.
- Benthic entrances (or low-level entrances close to the river bed) have not been provided, despite recommendations to include these in the Technical Review Report (TRR).
- The MRC Review noted very low flow speeds in the lower half of the 80-kilometer long reservoir compared with natural flows, but it did not address the abilities of migratory fish to adapt to a virtual still-water environment. These low flow speeds are raised as a concern in the review of sediment transport.

Photo: Jittrapon Kaicom

ii) Adequacy of data

- Most of the reports provided by the developers were in the form of summary PowerPoint presentations, meaning that the review team simply had to take their word for it that they had carried out the relevant scientific studies.
- The developers' presentations indicate that substantial work has been carried out to better understand baseline characteristics of the fishery, but since no such data or methods have been made available, there is little basis for the MRC Review to assess the efficacy of mitigation measures. **In effect, the developers are asking the MRC and other stakeholders to simply take their word for it that studies have been done and that the fish passage design will be effective.**
- The MRC Review indicates that little information has been provided on the ecological characteristics and requirements of specific species, on biodiversity, conservation status, endemism (or the uniqueness of species to a particular area) or on the transboundary implications of potentially affected fish migration.
- Surveys were only carried out three to four times per year, leading the MRC Review team to express the concern that key migrations could have been missed.
- For downstream fish passage, larval behavior remains unknown.

iii) Monitoring and operating rules

- No information was shared on the operating rules for the dam, meaning that the ability of the flow regime to be adjusted to enable optimum fish migration could not be assessed.
- A telltale concern is that the developers indicated that the required average flow down the fish pass of 83 cumecs (or cubic meters per second) would impact on the profitability of the dam, since this volume of water would be lost hydropower energy generation, and hence the design was adjusted to allow for a lower flow rate channeled through an auxiliary 8 MW turbine. **While it is difficult to assess precisely what this means for the effectiveness of the fish passage design, it clearly shows that the priority for the developer is achieving maximum power-generation and that fish passage mitigation is a secondary concern.**

Photo: Jittrapon Kaicom

- The MRC Review found that not all the measures identified in the TRR had been addressed, and that close monitoring would be required to assess the efficacy of those measures that had been applied in the redesign.
- The MRC Review therefore emphasized the importance of following up through the Joint Environmental Monitoring (JEM) arrangements in order to assess effectiveness and make any operational or infrastructural changes to respond to the findings of JEM.
- The MRC Review noted that no detailed or robust fish monitoring program upstream - including in the reservoir - or downstream has been provided or budgeted for.
- Most statements in the MRC Review on operational adaptations are qualified by the need for these to be in line with the provisions of the Concession Agreement and Power Purchase Agreement. These agreements thus effectively lock in constraints on adaptive management or operation of the dam.
- It is essential that any further Concession Agreements and Power Purchase Agreements for Mekong dams make provisions for potential adaptation of flows/operational rules, but this in turn requires a much greater level of transparency in the drawing up of such agreements. Because the Mekong mainstream dams - including Xayaburi - are private developments, the respective Agreements hide their provisions behind "commercial in confidence" requirements.
- Significant differences exist between the opinions of fisheries experts commissioned by the MRC and those commissioned by the developers. These differences have not been reconciled, in part because the TRR's recommendation to bring them together in a workshop was not taken up.

Sediment passage

The main sediment passage measure in the redesign is providing a lower gate sill level to allow for flushing of accumulated sediment trapped by the dam.

i) Redesign effectiveness

- The main design adaptation for sediment passage is lowering the sill level for the dam's radial gates to 14 meters above the river bed. This allows for sediment flushing once the bedload (the coarse particles transported across the river bed) and the flow of coarse sediment reaches the dam structure. The MRC's own Hydropower Mitigation Guidelines indicate that this will take some years to decades to become relevant, given that the low water velocity (0.3 m/s during the dry season), especially in the lower reaches of the 80 km long reservoir, will allow such sediment to settle out at the head of the reservoir and only gradually extend downstream.[12]
- The finer sediment will continue to move through the dam, particularly during the wet season when the major part of the sediment load is carried and when water velocities remain high and more closely approximate natural flow conditions. However, fundamental disagreement

[12] See MRC (2019). *Review of the Design Changes Made for Xayaburi Hydropower Project.* Technical Reference Paper No. 65, p.21 and 23.

remains between the MRC's own data and the claims of the developer regarding the proportion of sediment load accounted for by the finer sediment in the sediment load distribution. **The MRC Review suggests that up to 80 per cent of the incoming sediment load will be trapped for the first several years to decades of dam operation from just this one dam. The cumulative effects of a dam cascade would, therefore, result in virtual loss of sediment delivery from the lower-most dam, with grave implications for the Mekong Delta in Vietnam.**

- Associated with the loss of sediment from Xayaburi - and each subsequent dam - is an "erosional wave" downstream as "hungry water" (i.e. water starved of sediment) progressively erodes downstream river banks, and deposits sediment it accumulates in the next downstream reservoir. The MRC Review mentions this effect but gives no indication of the extent or implications of such erosional effects and their costs. It does, however, suggest that this can only be understood by looking at the whole cascade, which has not yet been done.

ii) Adequacy of data

- There is a major and unexplained discrepancy between the MRC's own sediment composition estimates and those of the developer, with the developer's estimates putting a much greater proportion of sediment at the finer end of the spectrum, therefore suggesting greater sediment passage and lesser trapping of sediment as compared to the MRC's calculations. **This discrepancy suggests a significant scientific disagreement that has an important bearing on Xayaburi's - and other mainstream dams' - capacity to trap/release sediment, which in turn have major implications for the delivery of sediment to the Mekong Delta.**

- The MRC Review was unable to assess the efficacy of the sediment passage measures in the absence of baseline data and noted that such data was not forthcoming in the developers' submissions.

iii) Monitoring and operating rules

- The MRC Review noted that it may take two to three decades for the impacts of the dam to be fully felt, but that monitoring and operating rules have not been detailed in the developer's information about the dam redesign and management.
- **The efficacy of the modified low-level gates cannot be assessed in the absence of operating rules, which have not been provided.**

Implications: Xayaburi as a model or benchmark?

The MRC Council Study was completed in 2018, seven years after it was first agreed to following a failure to obtain regional agreement on the Xayaburi dam through the PNPCA. The Council Study produced hard-hitting findings, including the potential loss of up to 97 per cent of sediment delivery to the Mekong Delta and the predicted loss of fisheries of 35–40% by 2020 and 40–80% by 2040 as a result of the cumulative effect of lower Mekong mainstream and tributary dams. The findings of the MRC Council Study appear to contradict the Xayaburi developers' assurances that tend to minimize the concerns over impacts to fisheries and sediment passage.

However, the Council Study findings were delivered when the construction of Xayaburi was substantially complete, and when the second lower Mekong mainstream dam (Don Sahong) is also nearing completion and therefore too late to inform decision-making on these projects.

> **The Council Study findings should send strong messages regarding the risks of proceeding with any further Lower Mekong mainstream dams.**

The MRC Review demonstrates that although Xayaburi is claimed to serve as a benchmark in the sense that it is the first dam to be built on the lower Mekong mainstream, and therefore offers lessons for consideration and design of future projects, there have been significant shortcomings in both the design and redesign of the project.

It is inaccurate to refer to Xayaburi as a benchmark project for future mainstream dams, given the deficiencies identified in the MRC Review report. The 400 million USD spent on the redesign have often been mentioned, but there is nothing in the documents provided that breaks down how these funds have been applied to the various components of fish passage, sediment passage, navigation and other aspects of the project's redesign. **Spending a lot of money does not guarantee effectiveness. The developer's advance claims of effectiveness do not guarantee efficacy.**

Greater transparency and peer review in the redesign, relevant associated baseline studies, matching of developers' and independent scientific assumptions on basic questions such as sediment load and size distribution, would have gone some way to making Xayaburi a benchmark project rather than a project from whose deficiencies future projects might learn. It is not at all clear whether Pak Beng and Pak Lay, located upstream and downstream of Xayaburi, respectively, and for which Prior Consultations (and associated Technical Review Reports) have been conducted, have taken on board the design measures of Xayaburi.[13]

[13] While the Joint Statements issued at the end of Pak Beng and Pak Lay Prior Consultation processes make reference to Xayaburi dam design measures, the text of Joint Action Plans, which are meant to support the implementation of the Joint Statements, make no reference to Xayaburi dam.

The MRC Review and regional cooperation on Mekong mainstream dams

Dr.Oliver Hensengerth

The Xayaburi dam was the first dam built on the Lower Mekong mainstream, triggering for the first time the Prior Consultation process under the Mekong River Commission's (MRC) Procedures for Notification, Prior Consultation and Agreement (PNPCA) when Laos submitted the project to the MRC in September 2010. The Xayaburi Prior Consultation process proved to be a conflictive one, with no agreement reached at the end of the mandatory 6-month period. Likewise, the MRC Council at its meeting in December 2011 was unable to reach agreement, and so the conflict effectively remains unresolved.

"The Xayaburi dam EIA was not made publicly available during the Prior Consultation process; there was no regional stakeholder consultation, only national and sub-national consultations."

Construction workers are working inside the tunnel of the navigation lock. / Photo: Jittrapon Kaicom

A Lao soldier is guarding construction workers while they are exploding the rock in front of the dam with flash powder. Photo: Jittrapon Kaicom

The MRC Review, dated January 2019, notes: "To date the Xayaburi prior consultation process has not led to any agreed measures to avoid, minimize, or mitigate the potential impacts, or established any record of the proposed use once commenced."[14] This indicated the weakness of the MRC as an intergovernmental organisation whose ability to coordinate regional planning is dependent on the willingness of its member states to allow it to effectively undertake this role.

Yet, the MRC proved still important for a number of reasons:

1. It provided a forum for discussion and conflict resolution that was observable in real time by civil society organisations, media, donors, academics and other interested parties. This exerted considerable public and diplomatic pressure on Laos to react to criticisms of its dam plans. Without the MRC and its PNCPA process, there would

[14] MRC (2019). *Review of the Design Changes Made for Xayaburi Hydropower Project.* Technical Reference Paper No. 65, p.5. <http://www.mrcmekong.org/assets/Publications/Review-of-the-design-change-made-for-Xayaburi-hydropower-project_technical-ref-paper_2019.pdf>.

Photo: Jittrapon Kaicom

have been a lack of procedures and guidelines to facilitate regional discussion of the impact of large-scale infrastructure. There would also have been a lack of transparency of planning, publicly accessible project documents, and various forms of research made available via the MRC website. The MRC, therefore, provided an important channel of communication, discussion, research, and information dissemination.

2. Related to the first point above, the MRC commissioned a Strategic Environmental Assessment (SEA), conducted by the International Centre for Environmental Management (ICEM) and released in 2010. The findings of the SEA – particularly the recommendation of a 10-year moratorium pending further research into the transboundary impact of the proposed mainstream dams – were an important rallying point for donors, media, local NGOs and communities. In particular, criticism highlighted the absence of knowledge of transboundary impacts on fisheries, given the dearth of research in this area.

Consequently, the research conducted or commissioned by the MRC, in conjunction with its formal Prior Consultation process, highlighted shortcomings of the Xayaburi project and enabled those critical of the project to use recognised research results within official processes to push Laos into concession.

While the long-awaited reforms of the PNPCA via the Joint Platform are important, it remains to be seen whether an improved PNCPA can mitigate the tensions between national sovereignty and a regional approach to transboundary water resources."

As a result, the Government of Laos (GoL) and project developers commissioned Pöyry to conduct a Compliance Study for the dam, to review the project documents and assess its compliance with the MRC's Preliminary Design Guidance (PDG).[15] Although the Compliance Study argued that Laos is fully compliant with all MRC guidelines and procedures, it also pointed out that the project requires improvements in areas of fish passages and sediment flushing.

This prompted Laos to engage in a face-saving process of redesign. Still, however, issues remained with the Xayaburi process: firstly, and in contrast to subsequent Prior Consultation processes, the Xayaburi dam EIA was not made publicly available during the Prior Consultation process; there was no regional stakeholder consultation, only national and sub-national consultations. Secondly, there were also issues with timely disclosure. For example, the MRC Secretariat review of the Pöyry report (dated November 2011) suggested, among other issues, that further studies be undertaken prior to – not parallel with – construction of the Xayaburi dam. This review was not made publicly available until late 2012. If it had been released in 2011, prior to/around the MRC council meeting, it could have contributed to more informed debate on the merits of the Pöyry report and construction of Xayaburi.

It is worthwhile to note that despite the contested process for Xayaburi, Laos has continued to submit subsequent projects for Prior Consultation under the PNPCA, first Don Sahong, followed by Pak Beng, Pak Lay and most recently Luang Prabang. It should be noted, however, that Laos resisted for some time submitting Don Sahong to the Prior Consultation process, and finally did so only after extensive campaigning and pressure. Laos maintains, however, that it has submitted to Prior Consultation voluntarily and not as a requirement.

The Xayaburi PNPCA helped prompt a number of additional studies as well as updates to the MRC's suite of guidelines, including the

[15] MRC (2019). *Review of the Design Changes Made for Xayaburi Hydropower Project.* Technical Reference Paper No. 65.

Transmission line and fish passage, July 2019
Photo: Thitipan Patt

MRC Council Study, which was published in 2018 after repeated delays. The Council Study put into sharp relief the absence of an effective basin-wide sustainable hydropower development mechanism to address the trade-offs and discuss sustainable and optimal hydropower development pathways.

This absence, in turn, has given new impetus to a number of updates and new developments in the MRC guidance and initiatives. These are positive developments and indicate ongoing value placed by member countries on the MRC. They include:

1. An update of the Preliminary Design Guidance, which is expected to be completed in 2019. This update seeks to close a number of gaps in the 2009 Preliminary Design Guidance, including by adding a new section on socio-economic impacts. This is important because the 2009 Preliminary Design Guidance formed the basis of MRC technical reviews of mainstream dams submitted to the Prior Consultation process. So far, this has applied to Xayaburi, Don Sahong, Pak Beng and Pak Lay.

2. New Guidelines for Transboundary Environment Impact Assessment (TbEIA)[16], which have perhaps been amongst the most contested new pieces of MRC guidelines. The TBEIA is currently a working document and it remains to be seen whether the TbEIA will be meaningfully implemented.

3. A new Joint Environmental Monitoring (JEM) initiative, which will be piloted at Don Sahong and Xayaburi dams. This proposes, amongst other items, to conduct a food security and livelihoods study related to fisheries across the basin, and to assess the effectiveness of fish passes for better mitigation measures.

4. A Review and Update of the Sustainable Hydropower Development Strategy for the Mekong (SHDS2019). This seeks to identify and analyse alternative hydropower development pathways and in doing so facilitate discussions on trade-offs.

[16] MRC (2018). *Guidelines for Transboundary Environmental Impact Assessment in the Lower Mekong Basin (Working Document).* < http://www.mrcmekong.org/assets/Publications/TbEIA-Guidelines-Final-version-25-9-2018.pdf>.

Xayaburi dam, July 2019 Photo: Thitipan Patt

5. The MRC Hydropower Mitigation Guidelines,[17] dated March 2018, which support whole basin planning as well as project development, and also support the Preliminary Design Guidance.

While overall this is a positive development, there are some caveats: The Preliminary Design Guidance and the Review and Update of the Sustainable Hydropower Development Strategy for the Mekong have been delayed in part due to the reluctance of the Lao government. Likewise, the Lao government also delayed the Joint Action Plan (JAP) for Pak Beng dam.

The JAP highlights many of the issues that the MRC and the above-named mechanism are facing and will be facing: a top-down planning approach versus meaningful stakeholder engagement along with identification of stakeholders; and an emphasis on national sovereignty which will continue to produce conflicts between countries' "rights and legitimate interests" and the principles of "sovereign equality" and "equitable and reasonable utilization" (Section III, Principles for Implementation).[18] Further, there are issues concerning who is involved in the development of guidelines; a focus of the guidelines on mitigation; and the extent to which these guidelines will actually influence planning and decision-making.

[17] MRC (2018). *Development of Guidelines for Hydropower Environmental Impact Mitigation and Risk Management in the Lower Mekong Mainstream and Tributaries.* <http://www.mrcmekong.org/assets/Uploads/ISH0306-Volume-1-Final-Guidelines2.pdf>.

[18] MRC (2019). *Joint Action Plan for the Implementation of the Statement on the Prior Consultation Process for the Pak Beng Hydropower Project.* <http://www.mrcmekong.org/assets/Publications/Joint-Action-Plan-for-Implementation-of-Statement-on-Pak-Beng_Unedited.pdf>.

Given these caveats, the Prior Consultation process is likely to remain of limited effectiveness in terms of the extent to which countries and developers engage with it. This includes the extent to which MRC members and developers respond to other member's criticisms, supply information for review, or suspend projects pending further research into their impacts.

In the case of Xayaburi, it is particularly noteworthy that the MRC Review highlights the absence of information on social and environmental impacts, which are the two key areas where large dams can have particularly detrimental impacts for water and food security for vulnerable communities. This, in turn, will influence the realisation of the Sustainable Development Goals. In particular this includes SDGs 1: No Poverty, 2: Zero Hunger, 3: Good Health and Well-Being, 6: Clean Water and Sanitation, 10: Reduced Inequality, 14: Life Below Water, and 15: Life on Land.[19]

Apart from member compliance, finding a common interpretation of what constitutes reasonable and equitable utilization (Article 5, 1995 Mekong Agreement) is an issue for the MRC. Principles of national sovereignty have so far prevented countries to take a regional approach to planning. Instead, countries appear to view collaboration over shared waters as zero-sum rather than positive-sum.

Fish passage
Photo: Pratch Rujivanarom

[19] United Nations, 'Sustainable Development Goals': http://sustainabledevelopment.un.org/sdgs

Implications: the urgency of a regional approach

As the MRC Review of the design changes to Xayaburi concludes: "regional strategies across the water-food-energy nexus will be required to comprehensively address sustainable development of the Mekong River Basin."[20] This highlights the failure of the MRC's Basin Development Plan to implement a regional approach. **While the long-awaited reforms of the PNPCA via the Joint Platform are important, it remains to be seen whether an improved PNCPA can mitigate the tensions between national sovereignty and a regional approach to transboundary water resources.**

The difficulties of regional collaboration are compounded by the need for sector coordination. The MRC's Mekong Basin-Wide Fisheries Management and Development Strategy 2018-2022, published in November 2017, acknowledges:

While hydropower dams have a wide range of impacts on primary production systems including farming, agro-industries and forestry, it is widely assumed that capture fisheries are most severely impacted.[21]

This means that implementing a basin-wide fisheries plan will not work unless all other water use sectors – hydropower in particular – are taken into account. This in turn requires serious inter-sectoral coordination between relevant sector ministries to address trade-offs in the food-water-energy nexus.

There is then also the problem of cumulative impacts. More recently proposed hydropower projects such as Pak Beng reference the Xayaburi redesign as an example of good practice. For example, the Joint Statement issued at the end of the Pak Beng Prior Consultation process recommended examining "the design and effectiveness of the fishpass facilities at the Xayaburi Hydropower Project when designing and constructing the fish pass for the PBHPP [Pak Beng Hydropower Project]."[22] In response, the GoL commented that the fish passage design for Xayaburi "has been adapted to Pak Beng."[23] However, it remains to be seen if and to what extent Xayaburi design measures will be incorporated into Pak Beng. Moreover, as the MRC Review notes, significant questions remain as to whether the redesign – particularly the fish passages – will be effective.

Reference to the Xayaburi redesign does not replace a regional approach to hydropower planning or at the very least conjunctive operation.

[20] MRC (2019). *Review of the Design Changes Made for Xayaburi Hydropower Project.* Technical Reference Paper No. 65, p.4.

[21] MRC (2017). *Mekong Basin-Wide Fisheries Management and Development Strategy 2018-2022,* p.28. <http://www.mrcmekong.org/assets/Publications/BFMS-Feb20-v-Final.pdf>.

[22] MRC (2017). *Statement on Prior Consultation Process for the Pak Beng Hydropower Project in Lao PDR*, p.3. < http://www.mrcmekong.org/assets/Uploads/Statement-Final-PBHPP-PC-Conclusion-240617.pdf>.

[23] Lao National Mekong Committee (2017). *Preliminary Responses to the Statement of MRC Joint Committee on the Pak Beng Hydropower Project*. <http://www.mrcmekong.org/assets/Uploads/Responses-to-the-Statement-by-Lao-PDR2.PDF>.

Xayaburi dam site,
July 2019
Photo: Thitipan Patt

Conjunctive operation of hydropower projects requires cooperation between countries, developers, and operators. The JEM process could play an important role in this regard, but member states need to put their weight behind it for the JEM to be effective.

Other current initiatives in the Mekong Basin could endanger any such endeavour. At the forefront of this is the Lancang-Mekong Cooperation, which is silent about the environmental and social impacts of hydropower dams, thus pushing social and environmental concerns further into the background.

> **A large dam is not just a piece of infrastructure to produce energy. It changes power relationships, social systems, and cultures – sometimes for better and sometimes for worse."**

A large dam is not just a piece of infrastructure to produce energy. It changes power relationships, social systems, and cultures – sometimes for better and sometimes for worse. Inclusive development requires internalisation of the negative impacts, especially in the case of vulnerable communities, such as indigenous groups or subsistence farmers and fishers. It also requires understanding and mitigating the impacts of gendered effects of large dams. Otherwise, large dams may foster uneven development by creating new wealth in cities but new poverty, water and food insecurity in dam-affected locations.

Photo: Jittrapon Kaicom