




Update on hydropower development on the Mekong River

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Mekong Dams Update

- Brief overview of proposed Mekong mainstream dams
- Status of Lower Mekong Dams under development in Lao PDR: Xayaburi, Don Sahong, Pak Beng
- Progress on Cambodian mainstream and tributary dams: Sambor, Stung Treng & Lower Sekong, Lower Sesan 2
- Pak Beng Prior Consultation process and MRC PNPCA developments
- Basin-wide and cumulative impact studies – impacts of dams on Mekong Delta




Overview of Mekong mainstream dams

Project	Province/ Country	Status	Developer	Power / Inundated Area
Pak Beng Dam	Oudomxay, Lao PDR	MOU signed in 2007, with China Datang Overseas Investment. In March 2014, Datang received environmental permits from the Lao Government (GoL). Gol. submitted the Pak Beng Dam for Prior Consultation under the MRC's PNPCA process on November 8. Prior Consultation officially began December 2016.	Datang International Power Generation Co. Ltd.	912MW (90% slated for Thailand, 10% for Laos)
Luang Prabang Dam	Luang Prabang, Lao PDR	MOU signed 14/10/2007 New studies underway	PetroVietnam Power Corporation (Viet Nam)	1410 MW / 110 km2
Xayaburi Dam	Xayaboury, Lao PDR	MOU signed 04/05/2007 PDA signed 25/11/2008 PNPCA initiated 22/09/2010 Construction as of May 2017 close to 75%	Ch.Kanchang (30%), EGCO (12.5%), PTT (25%), Laos (20%), Bangkok Expressways (7.5%)	1285 MW



Project	Province/ Country	Status	Developer	Power / Inundated Area
Pak Lay Dam	Xayaboury, Lao PDR	MOU signed 11/06/2007 EIA Approved	PowerChina Resources	1320 MW / 110 km2
Sanakham Dam	Vientiane, Lao PDR	MOU signed 11/12/2007 EIA Approved Likely to follow Pak Beng	Datang International Power Generation Co. Ltd.	700 MW
Pak Chom Dam	Vientiane, Lao PDR and Laos, Thailand	Shelved - not being considered right now	*Department of Alternative Energy Development and Efficiency, MofT, Thailand (Thailand)	1079 MW / 80 km2
Bun Khom Dam	Champasak, Lao PDR and Ubon Ratchathani, Thailand	MOU signed 25/03/2008	Italian-Thai Development PLC & Asia Corp. Holdings Limited. (Italy-Thailand)	1872 MW / 158 km2
Phon Ngeuy Dam (Formerly Lat Saa)	Champasak, Lao PDR	MOU signed 02/04/2008 PDA 7/12/2010 EIA underway by Thailand's Panya Consultants and China's Hydrochina Engineering (CP Group)	Charoen Energy and Water Asia Co. Ltd.(Thailand) (CP Group)	Unknown (possible 651 MW)

Project	Province/ Country	Status	Developer	Power / Inundated Area
Don Sahong Dam	Champasak, Lao PDR	MOU signed 2010 EIA approved 2013 PNPCA began 25/07/2014	Mega First Corporation Berhad (Malaysia)	260 MW / 1.6 km2
		Construction began January 2016 Construction more than 25% complete as of May 2017	Sinohydro (China)- EPC Contractor	
Stung Treng Dam	Stung Treng, Cambodia	MOU signed 08/12/2009 Pre-feasibility study completed	Royal Group, likely Hydroblanching	900 MW / 640 km2
Sambor Dam	Kratie, Cambodia	MOU signed 04/11/2010 Natural Heritage Institute (USA) working with MME on two studies (1) alternative designs, (2) 2011, stating they were "responsible company." In October 2016, the Cambodian Cabinet gave in principle approval to MOU for feasibility studies for Sambor and Stung Treng Dams.	China Southern Power Grid, original developer dropped out of project in 2011, stating they were "responsible company." Hydroblanching and Royal Group	2,600MW (original favored option) 465 MW or 2600 MW 880 km2




Xayaburi Dam



Xayaburi Dam

- Approx. 75% complete, scheduled for completion and commercial operation in 2019
- Resettlement completed (according to developer's schedule)
- Additional 400 million USD invested in project redesign including: sediment flushing, fish monitoring, fish passage improvements, fish lift and bypass ('state of the art' facilities)
 - Fish studies and design changes while project under construction
 - Full redesign details still have not been made public
 - No assessment of compliance with MRC Preliminary Design Guidance for LMB Hydropower – on MRC workplan for 2017
- MRC has cited outcome of Xayaburi as 'model' for Prior Consultation

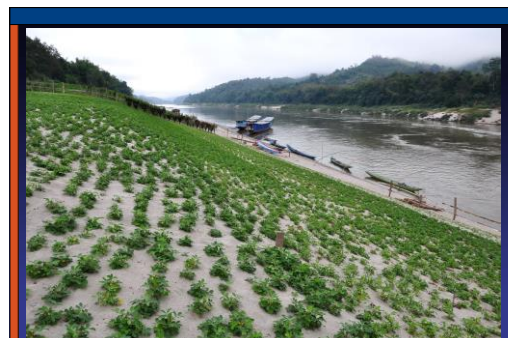


Don Sahong Coffer Dam



Don Sahong Dam

- Groundbreaking ceremony in January 2016, construction of coffer dam complete and Hou Sahong channel blocked by June 2016, commenced project powerhouse in August 2016
- Construction more than 25% complete
- Scheduled for completion and commercial operation 2019
- Resettlement (14 households) completed February 2016
- Developer claims modification of surrounding channels is complete; fish monitoring studies and adaptation of mitigation measures ongoing (FishMAP) but results have not been published
- No formal clarification on resolution of concerns raised by other riparian states during Prior Consultation



Pak Beng, Laos



Pak Beng Dam

- Laos Notification to MRC in November 2016
- Developer: China's Datang Corporation, proposed electricity sale to Thailand (PPA not yet signed)
- First MRC Joint Committee meeting for Prior Consultation Process in January 2017, announce start of process as December 2016
- Project documents published on MRC website in February 2017: EIA, SIA, Resettlement Plan, project design document, include Transboundary EIA and cumulative impact assessment
- Two regional stakeholder consultations, national consultations held in each country
- End of initial six month Prior Consultation scheduled for 19 June 2017



Cambodian Dams

- October 2016 – Cambodian Council of Ministers approval for MME to enter into MOU with Royal Group for feasibility and EIA studies for Sambor Dam (2600MW), Stung Treng Dam (900MW), Lower Sekong Dam in 3S Basin (190MW)
 - 2017 – MME reported stating no MOU signed yet
- Hydrolancang to explore development of Sambor Dam with Cambodia's Royal Group through joint venture
- Electricity proposed for domestic use and sale to Vietnam
- Natural Heritage Institute (NHI) carrying out studies on behalf of MME for alternative options and 'no dam option' for Sambor Dam
 - NHI's previous studies looked at three options for sediment management: 2,000MW, 1,363MW and 1,700MW design
 - NHI conducting industrial scale solar feasibility study in Cambodia
- Lower Sesan 2 – proposed closure of dam gates and filling reservoir August 2017; commence operations by end of 2017



Regional cooperation and decision-making: MRC and PNPCA

- Joint Platform for Procedures established to review MRC procedures including PNPCA due to concerns with implementation of PNPCA for Xayaburi and Don Sahong
- MRC Workshop in February 2016 – Lessons learnt from implementation of PNPCA.
 - Dialogue report from workshop published MRC website Feb 2017
 - MRC continue to work on "draft working paper on lessons learned" as a living document to support implementation of PNPCA"
- Some key recommendations around:
 - Standard of documentation to inform Prior Consultation
 - Need for appropriate project information disclosure and improved stakeholder engagement
 - Clarity on commencement and conclusion of PC



Pak Beng Prior Consultation Process

- Development of Prior Consultation based on lessons learned:
 - Emphasis on information-sharing and 'stakeholder engagement' (focus at regional level)
 - Sharing of project documents, inclusion of transboundary and cumulative impact studies
 - Role of MRC and technical review process
 - Plans for post-consultation to ensure agreed outcomes
- Concerns with Pak Beng Prior Consultation:
 - Quality of information: inadequate studies, including transboundary and cumulative impact assessment. Assessments do not take into account existing and under construction projects
 - Limited scope for meaningful input to process
 - Emphasis on post-consultation rather than extending timeline
 - No reference to / link with basin-wide studies, including MRC Council Study



Basin-wide and cumulative impact studies

- MRC-commissioned Strategic Environmental Assessment (SEA) 2010
- Vietnam's Mekong Delta Study 2016
- Economic Evaluation of Hydropower Projects in the Lower Mekong Basin April 2017 (Mae Fah Luang University, Thailand)
- Studies and research on climate change and hydropower
- MRC Council Study – now scheduled for completion in December 2017



Strategic Environmental Assessment on Mekong mainstream hydropower (2010)

- **Key findings for Viet Nam:** Likely overall economic loss. Losses borne predominantly by poorer communities in the Mekong delta.
- **OPPORTUNITIES:** Economic benefits of improved power supply (from imported power)
- **RISKS:** Significant loss in fresh water and marine capture fisheries and aquaculture – will affect livelihoods of fisher folk in delta, especially poorer groups. Loss of sediments and associated nutrients with significant adverse economic affects to deltaic sedimentation, fisheries (Mekong and marine) and agriculture.



Economic Evaluation of Mekong Hydropower Projects

- The overall economic impact of planned Mekong hydropower projects would be negative. The negative economic impact is mainly due to the economic value of capture fisheries loss being much larger than benefits from hydropower.
- Social mitigation costs and loss of sediment/nutrients also have a significant economic impact.
- The economic impact on Lao PDR and Thailand is forecast to be positive, with Thailand being the main beneficiary.
- Vietnam and Cambodia forecast to suffer large negative economic impacts.


Mae Fah Luang University, Thailand (April 2017)



Recommendations from study on downstream impacts of Upper Mekong Dams

- Construction of large dams on upper Mekong have resulted in widely fluctuating river flows, depending on hydropower operations.
- River flow regime or flood pulse a key driver of the biodiversity and productivity of the Mekong River. Flow changes likely to lead to lowered ecosystem productivity, with significant impacts on ecosystems and communities that depend on the Mekong.
- There is a lack of publicly available information on hydropower operations and their downstream impacts.
- Findings of study call for active engagement and cooperation between countries to address negative effects of hydropower development: improved information sharing, research collaboration and agreement on maintaining acceptable river flows needed.

Timo A. Räsänen et al. Observed river discharge changes due to hydropower operations in the Upper Mekong Basin, *Journal of Hydrology* (2017).



MRC Council Study

- Initiated by Mekong leaders at the 3rd Mekong-Japan summit in 2011, following Prior Consultation process for Xayaburi Dam.
- Agreed that further study on the development and management of the Mekong River, including the impacts of mainstream hydropower projects, essential.
- Seen as complement to individual assessment and decision-making through Prior Consultation
- Objective to "close important knowledge gaps on how different water resources developments including mainstream hydropower will impact the river basin environmentally, economically and socially."
- Scheduled for completion December 2017.



Take Aways

- Poor precedent set by Xayaburi and DSH from technical and procedural stand point.
- Importance of Mekong community voices in decision-making on Mekong dams.
- Basin-wide cumulative assessments and scientific study essential to inform decision-making on projects.
- Sequencing of project studies and decision-making: need for credible baseline data to inform decision-making, design and proposed mitigation measures.

