

The 5th Regional Stakeholder Forum

First Regional Information Sharing on Pak Lay Prior Consultation Process

20-21 September 2018

Landmark Hotel, Vientiane, Lao PDR



Approach and Methodology for Assessment of the Pak Lay Hydropower Project

Hydrology & Hydraulics, Sediment Transport & River Morphology

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OUTLINE



Overview of submitted documents



Potential changes based on recognized characteristics of the Mekong River



Relevant sources for information



Reviewed parameters for Hydrology and Hydraulics



Reviewed parameters for Sediment Transport and River Morphology



Methodology

Overview of submitted documents

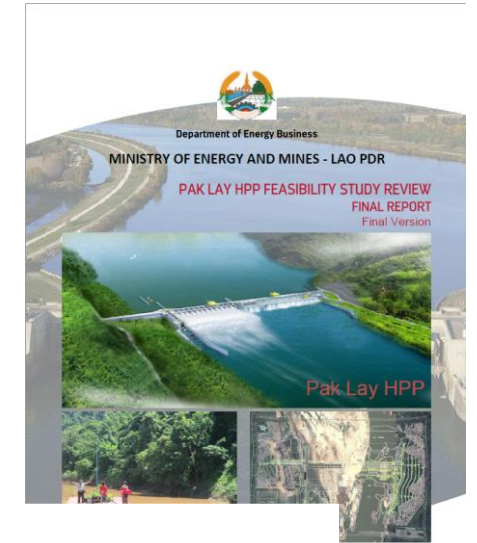
Submitted documents cover among others:

- Engineering components and its drawings
- Hydrological and sediment data collection
- Sediment data sampling
- Flow/sediment analysis
- Sediment management and monitoring
- Hydraulic physical model
- Model simulation
- Automatic system of hydrological data collection and forecasting
- Impacts and mitigation on a local and a transboundary scale

LAO PEOPLE'S DEMOCRATIC REPUBLIC
PAKLAY HYDROPOWER PROJECT
Feasibility Study Report
FINAL
(Chapter 8 - 11)



DEVELOPER:  中国电建集团海外投资有限公司 **CEIEC**
POWERCHINA FOREIGN INVESTMENT CO., LTD. 中国电子进出口总公司
CONSULTANT:  中南勘测设计研究院有限公司
ZHONGNAN ENGINEERING CORPORATION LIMITED
March, 2017



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(Chapter 2 - 4)



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 **ENGINEERING**

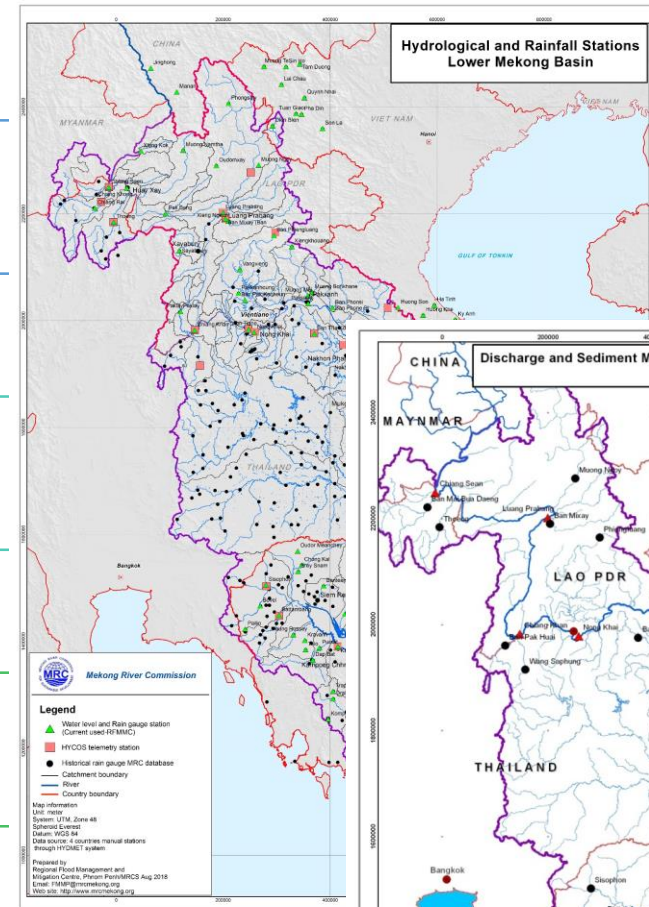
Potential changes based on recognized characteristics of the Mekong River

Understanding the nature of the river channel in the considered region and basin-wide context (floodplain, wetland, deep pool,...)

Records of relevant gauging stations upstream/downstream of project, providing relevant knowledge on historic natural seasonal and daily variations of the Mekong mainstream

Distribution of bedrock/alluvial/composite channels in the mainstream and tributaries potentially affected by proposed development

Distribution of availability of data on discharge, suspended/bed load and bed materials based on the results of the Discharge and Sediment Monitoring Project (DSMP)



Relevant sources for information

- **Preliminary Design Guidance** for Proposed Mainstream Dams in the Mekong River (**PDG**)
- Guidelines for Hydropower Environmental **Impact Mitigation and Risk Management** in the Lower Mekong Mainstream and Tributaries (**ISH0306**)
- PNPCA process for **Xayaburi** and **Pak Beng** HPPS
- (Draft) Basin-wide **Sustainable Hydropower Development Strategy** (**SHDS**)
- The **Mekong Climate Change Adaptation Strategy and Action Plan** (**MASAP**)
- **Xayaburi Design Changes** Review
- Procedures for the Maintenance of Flows on Mainstream – **PMFM**
- Results of the MRC **Council Study**
- Information available from other **relevant hydropower projects** (Nam Ngum, Nam Theun 2, Nam Ou, ...)
- Expert opinion from other **hydrologists, sedimentologist, geomorphologists** and **hydropower engineers**



Reviewed parameters for Hydrology and Hydraulics

Hydrological regimes upstream and downstream of the project site

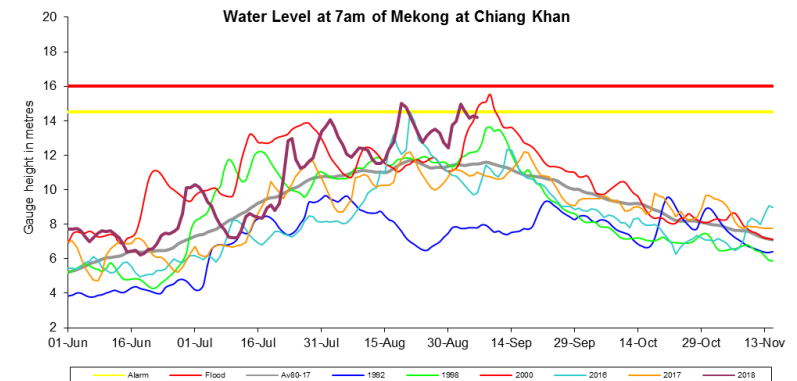
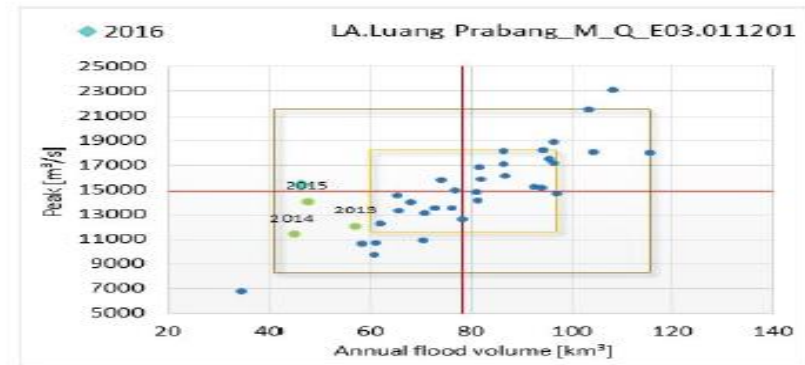
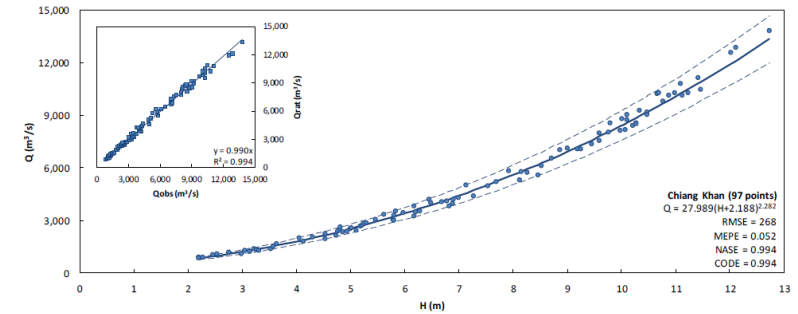
Seasonality of the flow (wet season, dry season, timing, ...)

Water levels and discharge at relevant hydrological stations upstream and downstream

Inflows from tributaries/catchments

Flow conditions in the channel, deep pools and bank zones

Relevant hydro indicators required for evaluations for **other themes** (ecology, sediment, navigation, ...)



Reviewed parameters for Sediment Transport and River Morphology

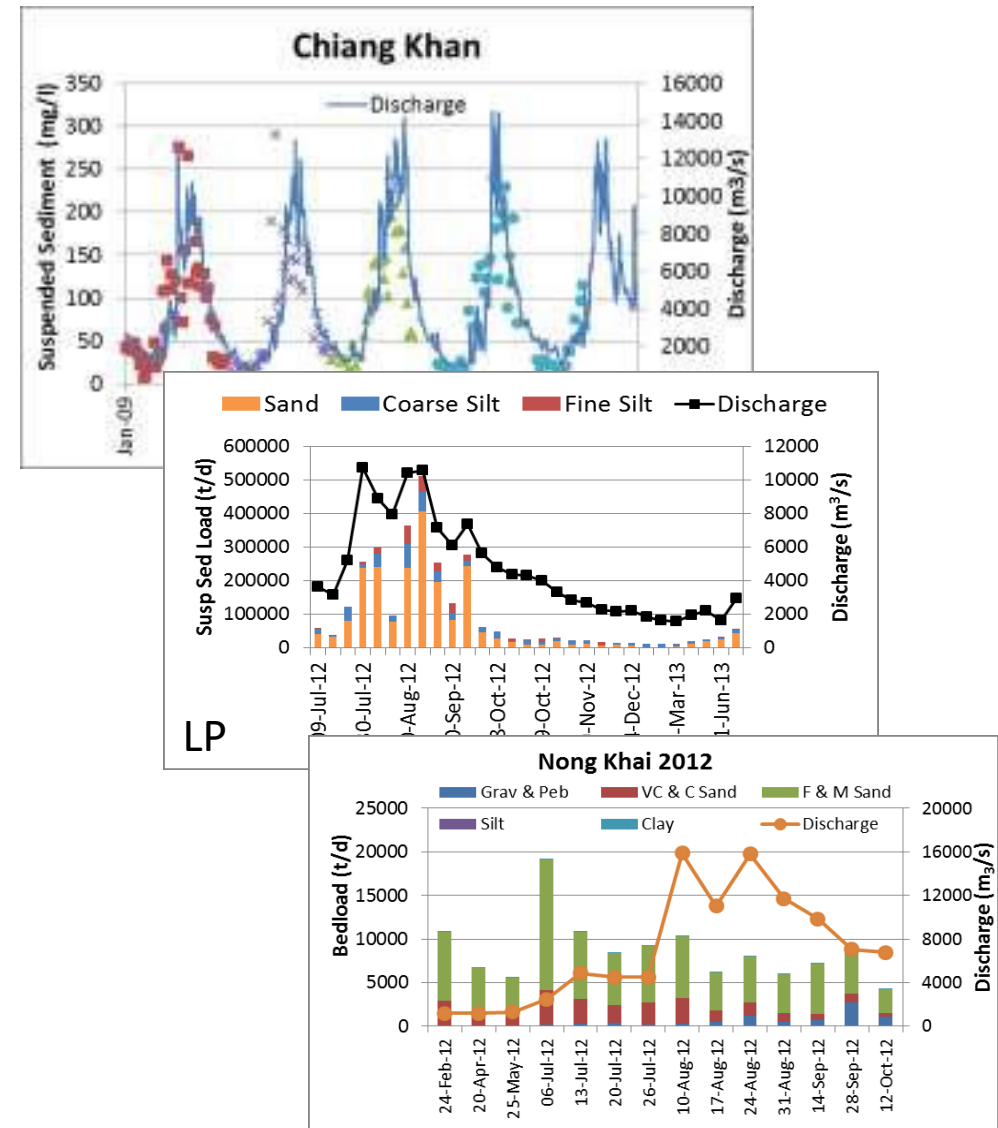
Sediment loads: suspended and bedload

Sediment grain-size distribution: Suspended load, bedload, bed materials

Seasonality of sediment transport: Dry season, wet season

Sediment characteristics: Grain-size of suspended/bedload sediment in wet/dry season

Existing hydrologic information where relevant to sediment transport



Methodology (1 of 4)

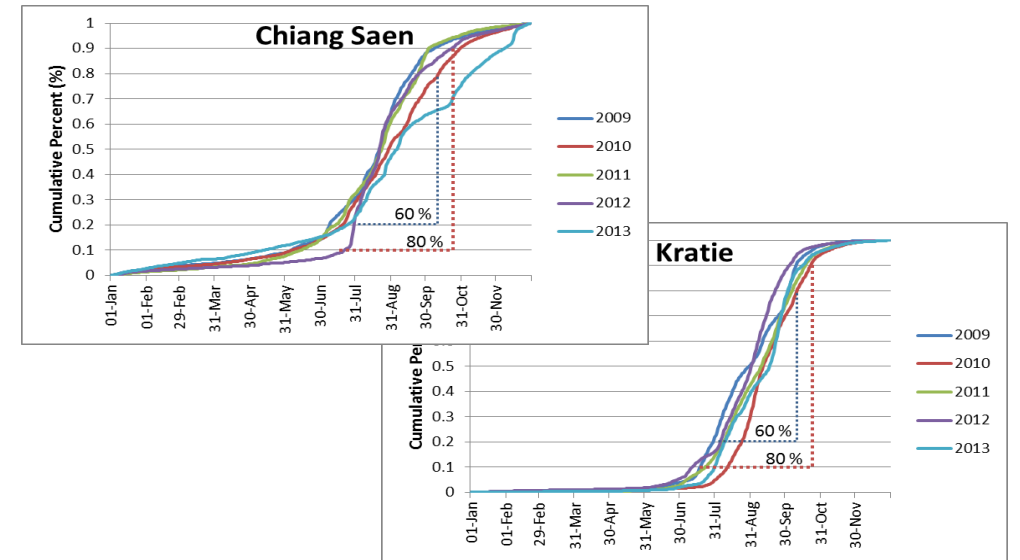
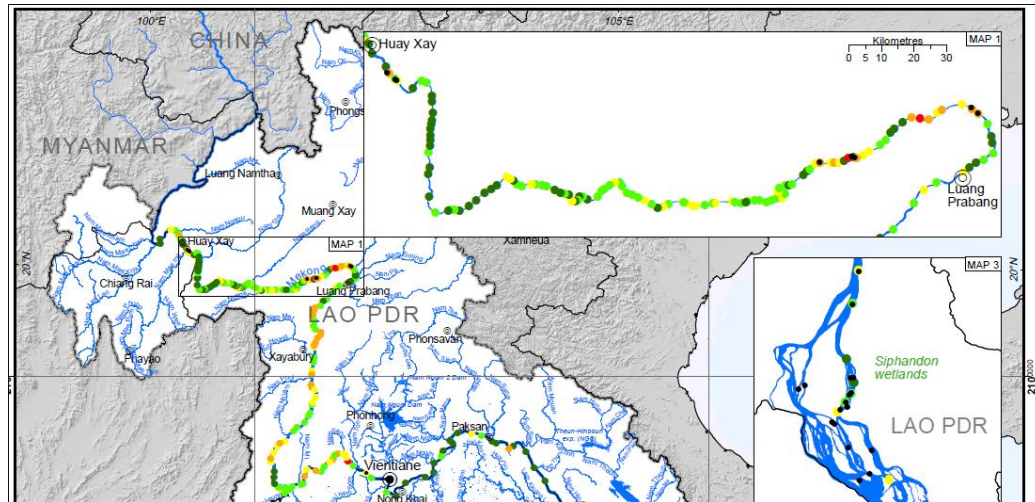
- **STEP 1 – Comparison of the baseline information** presented in the Pak Lay Hydropower Project reports with available information (*potential causes if differences are found*)



- **STEP 2 – Review of the proposed mitigation and management** components with respect to the **MRC Preliminary Design Guidance** for Proposed Mainstream Dams in LMB.
 - **Hydrology/Hydraulics**: ramping rate, hydro peaking, downstream flow fluctuations, ...
 - **Sediment/Morphology**: reservoir sedimentation, sediment starvation downstream, strategies to maintain reservoir capacity, and sediment management and mitigation strategies, ...

Methodology (2 of 4)

- **STEP 3 – Review of the dam design and proposed management and mitigation measures to ensure the passage of flows/sediments through the impoundment to minimize rapid fluctuations due to operations**
- **STEP 4 – Evaluation of the potential residual impacts (taking mitigation measures into consideration)**



- **Hydrology/Hydraulics:** changes in water level/discharge or flow regimes
- **Sediment/Morphology:** changes to sediment transport/deposition/erosion upstream/downstream of impoundment considering potential impact on geomorphic features (river channel, deep pools or wet lands)

Methodology (3 of 4)

- **STEP 5 – Evaluation of the proposed hydrological/sediment monitoring programme** to ensure that it has the capacity to identify and quantify potential impacts
 - Compare with **international best practice** and **scientific monitoring technique**
 - Evaluate whether the **spatial/temporal scales** of proposed monitoring are adequate
- **STEP 6 – Evaluation of proposed management measures in response to changes** detected through the monitoring programme (using mitigation guideline study results). If applicable, additional recommendations to maximize the potential for maintenance of the flow/sediment balance

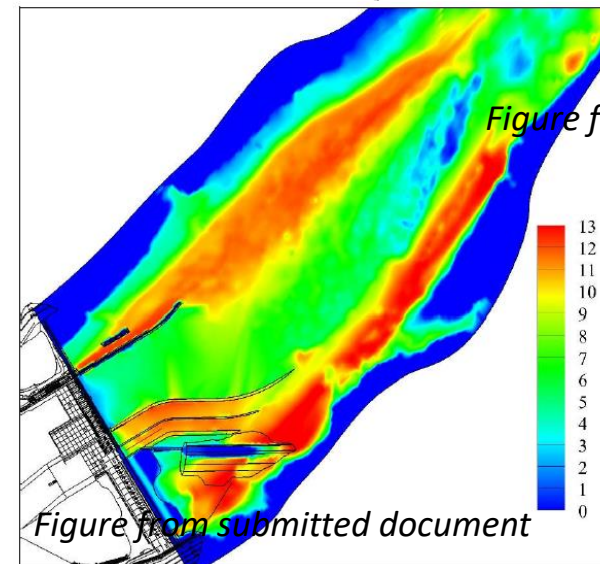
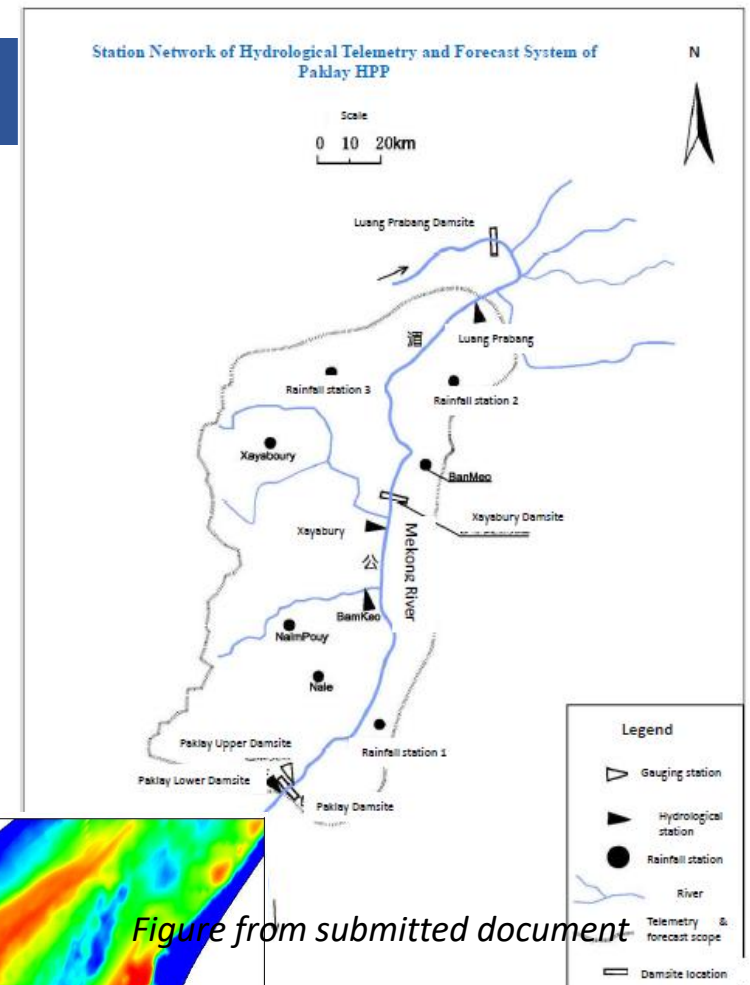


Figure from submitted document

Figure from submitted document

Thank you

