

# ENVIRONMENTAL STUDY OF THE LANCANG-MEKONG DEVELOPMENT PLAN

## Study background

Photo: Petro Kotze (ICEM)

## 1. INTRODUCTION

The Mekong is one of the world's great rivers. Running through six countries – originating in PR China, continuing to form the international borders between Myanmar and Lao PDR, then between Lao PDR and Thailand before it flows onward to Cambodia and Viet Nam. It is of fundamental cultural, ecological and economic importance to the entire Mekong region, meaning that much is at stake when choices regarding the development of the river are made.

## 2. THE PROPOSED DEVELOPMENTS

### 2.1 Lancang Mekong Navigation Plan

In February 2016, the Joint Committee on Coordination of Commercial Navigation (JCCCN) on the Lancang-Mekong River (JCCCN) gave conditional approval for the 'Development Plan of International Navigation on the Lancang-Mekong River (LMDP) 2015-2025'. The JCCCN comprises representatives from Lao PDR, Thailand, PR China and Myanmar with MRCS as an observer. The committee is covered by a joint agreement for commercial navigation between Simao in PR China and Luang Prabang in Lao PDR.

### The key aspects of the full LMDP are:

- ✓ To upgrade several cargo ports: Ban Sai, Xieng Kok, Muong Mom, Ban Khouane, Houay Xay, Pak Beng, Luang Prabang, Chiang Saen and Chiang Khong. Only Houay Xay, Pak Beng, Luang Prabang, Chiang Saen and Chiang Khong are in the ES study area and Chiang Saen port has already been upgraded.
- ✓ Partial clearing of 146 rapids, rocky outcrops and shoals to allow navigation for up to 500DWT vessels in the whole stretch covered under the JCCCN between Simao, PR China and Luang Prabang, Lao PDR<sup>1</sup>. 23 dangerous areas have been surveyed by the MRC in the study area – which are assumed to be targeted for clearing under the LMDP and hence assessed under the ES.
- ✓ Construction of four emergency response and rescue ships and 1199 aids to navigation.
- ✓ Promoting increased shipping, trade, passenger transport from Yunnan province to Luang Prabang.

<sup>1</sup> It is understood that most of the rapids upstream of the Golden Triangle have already been cleared hence the focus of this study is on the Golden Triangle to Luang Prabang stretch.



## 2.1.1 Agreement on commercial navigation on Lancang-Mekong River

The Agreement on Commercial Navigation on the Lancang-Mekong River, signed at Tachileik on 20 April 2000, forms the legal basis of the opening of the Upper Mekong for international navigation. The Parties to this Agreement are People's Republic of China, Lao PDR, Myanmar and Thailand. The aim of the agreement is to develop international passenger and cargo transportation among the Contracting Parties on the Lancang-Mekong River, to promote and facilitate trade and tourism, and strengthen cooperation in commercial navigation. Vessels of any Contracting Party are entitled to sail freely between Simao in China and Luang Prabang in Lao PDR according to the provisions of this Agreement and the relevant rules and regulations jointly adopted by the Contracting Parties.

The JCCCN was established to oversee the implementation of the agreement and develop regulations for navigation safety, emergency response and trade facilitation. The JCCCN comprises representatives from transport departments from Lao PDR, Thailand, PR China and Myanmar. The current navigable river section is 890 kilometres long from Simao, China, to Luang Prabang, Lao PDR.

### Navigation is categorised by:

- 1 Simao to boundary marker 244 (290 km) for vessels of 300 DWT;
- 2 Boundary marker 244 to Houay Xay (300 km) for vessels of 150 DWT throughout the year and 200-300 DWT seasonally; and
- 3 Houay Xay to Luang Prabang (300 km) - has never been improved and maintained and is currently navigable for vessels of 60 ton in the dry season.

### The planning goals under the LMDP are:

- ✓ To make the total length of the JCCCN Lancang-Mekong navigable for 500 DWT vessels by 2025; and
- ✓ To upgrade the ports of Ban Sai, Xieng Kok, Muong Mom, Ban Khouane, Houay Xay, Pak Beng, Luang Prabang, Chiang Saen and Chiang Khong.





## 2.1.2 Environmental assessment framework

This stretch of the river encompasses portions of the administrative units of western Luang Prabang Province, northern Sainyabuli Province, southern Oudomxay Province and southern Bokeo Province, Lao PDR, as well as part of northern Chiang Rai Province (Chiang Saen District), Thailand. Prior to undertaking any port construction or waterway improvement, the environmental law and assessment framework would need to be considered in both Lao PDR and Thailand. Table 1 provides a summary of the environmental assessment framework and the size and type of project/activities that require an environmental impact assessment (EIA). The draft LMDP states that an EIA will be conducted as part

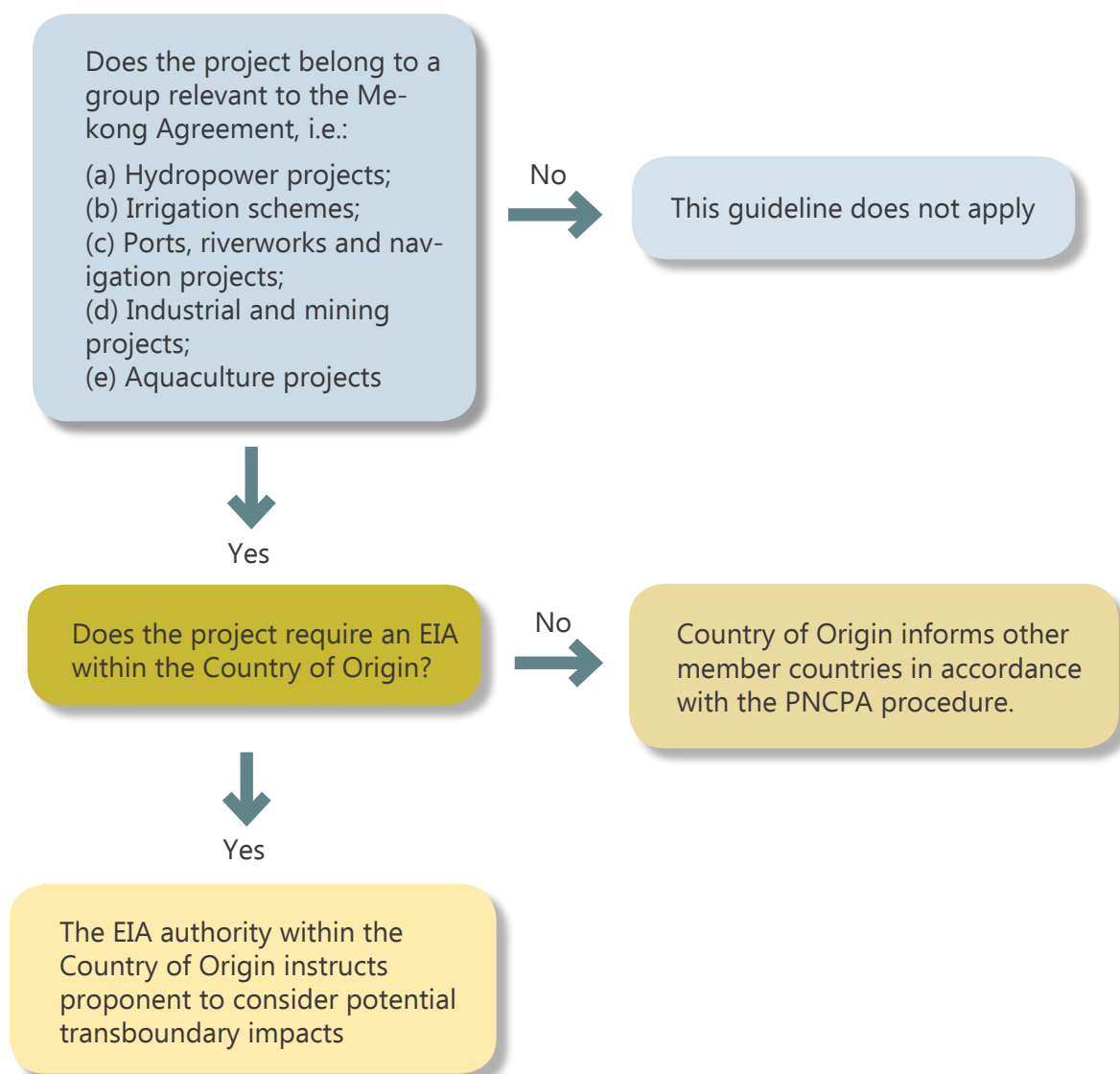
of Phase 1, however it could not be determined to what standard and how the assessment would be approved. The approval of the EIA would be particularly complex as all but one of the ports (Chiang Khong) will be constructed in Lao PDR and the navigation improvements will take place in both Lao PDR and Thai waters. Separate EIAs should be prepared for each of the ports and for specific sections of the river in relation to waterway improvement projects to ensure approval by the Government of Lao PDR and Thailand under relevant environmental protection law. The JCCCN would also need to ensure transboundary and cumulative impacts are considered.

**Table 1: Environmental law and assessment framework**

Country	Law	Size and type of project/activities for IWT	Environmental assessment framework
Lao PDR	Environmental Protection Law 2013	Not specified	<p><b>Initial Environment Examination (IEE):</b> minor environmental impacts</p> <p><b>SEA:</b> process of assessing environmental and social impact while developing strategies and programs undertaken by sectors</p> <p><b>EIA:</b> assessing environmental and social impacts from investment projects or activities</p>
Thailand	National Environmental Quality Act 1992	<p><b>Port:</b> Capacity of vessels more than 500 DWT, berth length more than 100m or total area is more than 1000m<sup>2</sup></p> <p><b>Recreational port:</b> Capacity of more than 50 vessels</p>	<p><b>EIA</b></p> <p><b>EMP and monitoring</b></p>

**Figure 1: Scope of application of the transboundary EIA guidelines flowchart**

The MRC has developed Guidelines for Transboundary Environmental Impact Assessment (TbEIA) in the Lower Mekong Basin to specifically deal with assessing potential transboundary impacts of projects falling into the scope of 1995 Mekong Agreement. The scope and application of the TbEIA Guidelines is shown below in figure 1.



As the LMDP will be implemented within multiple countries - PR China, Myanmar, Lao PDR and Thailand – these are all considered ‘Countries of Origin’ under the TbEIA Guidelines. The potential transboundary impacts of the LMDP works to be conducted within each country will need to be considered separately within each respective EIA.

\*The TbEIA Guidelines also apply to the Pak Beng HPP.

**2.1.3 The Lancang-Mekong Cooperation Mechanism**

The LMCM was launched in November 2015 and is a six-country collaboration agreement between China, Myanmar, Lao PDR, Thailand, Cambodia, and Vietnam. The agreement covers five priority areas: 1) interconnectivity (transport, power and communications); 2) production capacity; 3) cross-border economic cooperation; 4) water resources and cooperation on agriculture and; 5) poverty

reduction. The LMCM is much broader than other Mekong agreements, such as the Greater Mekong Subregion (GMS), which has the same membership and MRC agreement. There are also potential linkages with the Asian Infrastructure Investment Bank (AIIB) launched in January 2016. The arrangements for member countries to assess sustainability implications of developments remain uncertain.

2 <http://www.mrcmekong.org/assets/Publications/TbEIA-Guidelines-Final-version-25-9-2018.pdf>

## 2.2 Pak Beng hydropower project

During the scoping phase of this LMDP environmental study, it became evident that the Lao PDR Government would initiate the MRC Procedures for Notification, Prior Consultation and Agreement (PNPCA) process for the Pak Beng hydropower project (HPP).

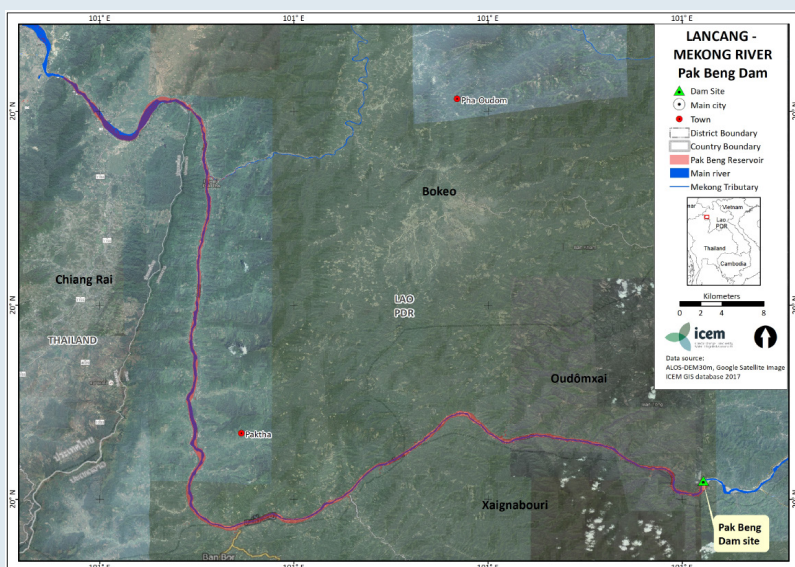
The Pak Beng Hydropower Project (PBHPP) is located approximately 14 km upstream of Pak Beng town on the Lancang-Mekong River in northern Lao PDR. The dam reservoir extends approximately 96 km upstream of the dam site (Figure 2), effectively

ending (insignificantly beyond) where the Mekong enters Thailand a few kilometers upstream of Pak Tha. The Pak Beng HPP is therefore assessed as a scenario in the impact assessment phase in this project. The proposed Pak Beng HPP is to be a concrete run-of-river gate dam (64m high or 47m from river bed x 900m long), as shown in Figure 3. There will be navigation locks for 500DWT boats and the dam is also planned to include a fish passage cement canal of 1.6 km length and 10 m bottom width. The increase in water level at the dam will be approximately 27 m. Key design features and status of the PBHPP are given in Table 2.

**Table 2: Key design parameters and status of Pak Beng Hydropower Project (taken from MRC 2018)**

	Design Flow	Full Supply level	Capacity	Annual generation	Status
Pak Beng	4100m <sup>3</sup> /s (5771m <sup>3</sup> /s)	340/335 masl	912 MW	4 800 GWh	Prior consultation concluded. Expected 2023

**Figure 2: The Pak Beng HPP location and reservoir extent upstream**



**Figure 3: A computer image of the proposed Pak Beng HPP dam (Photo courtesy of Pak Beng hydropower project)**



### 2.2.1 PNCPA for Pak Beng HPP

On 4 November 2016 the LNMC submitted the detailed description of the planned Pak Beng HPP to the MRC for its review to inform the other member countries about the project's scope and other requirements under the prior consultation process. The prior consultation is part of the MRC's procedural rules on cooperation on water use of the Mekong mainstream: Procedures for Notification, Prior Consultation and Agreement (PNPCA). Under the procedures, any project using

the mainstream water during the dry season within the same basin, as well as during the wet season between two basins, must undergo the prior consultation process. Given the central importance of the proposed Pak Beng reservoir to the LMDP, this ES has taken it into account in the baseline and impact assessment. An EIA and SIA have been completed for Pak Beng HPP by the developer – Kunming Engineering Corporation Limited.

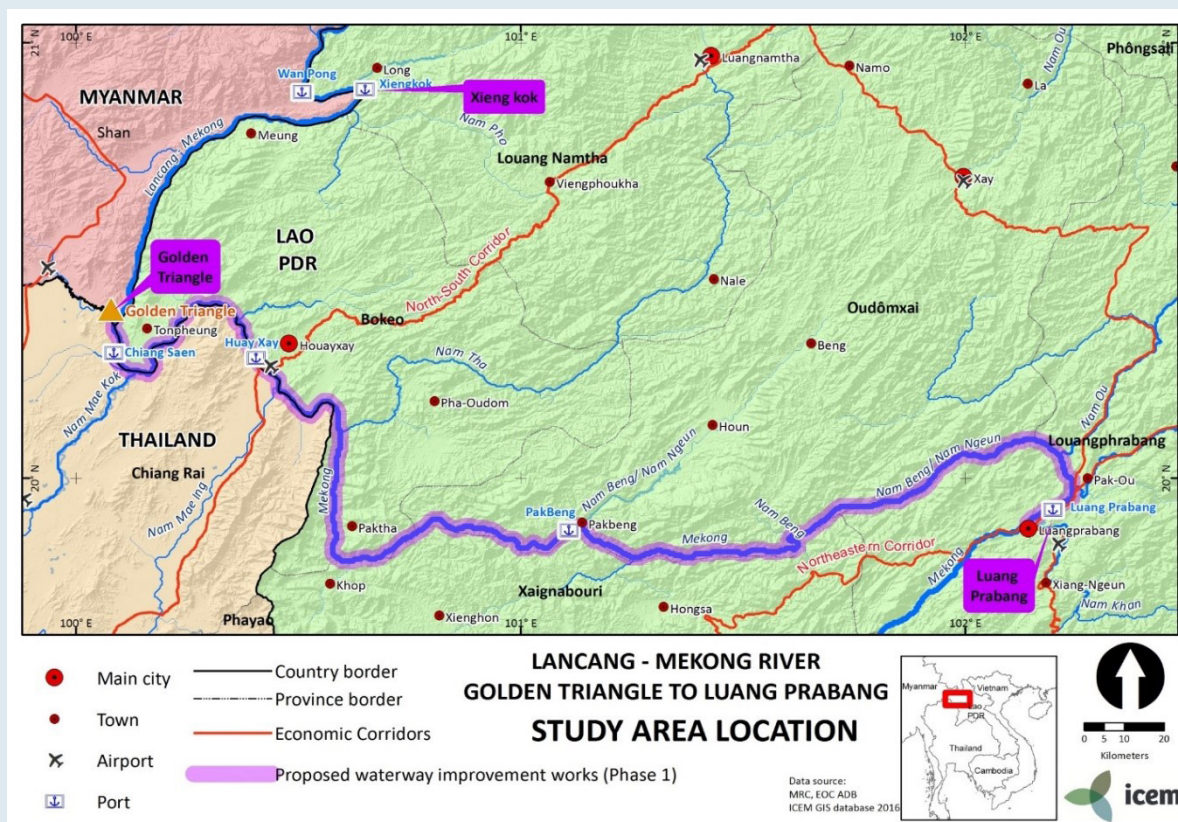
### 3. THE STUDY

There may be significant long-term and irreversible social and environmental impacts of the LMDP from port construction, increased waterway use and partially removing 146 rapids and shoals to improve navigation. The environmental and social impacts need to be fully assessed. As the LMDP does not currently include a comprehensive environmental management plan, the Critical Ecosystems Partnership Fund (CEPF) allocated grant funding to ICEM to conduct an Environmental Study (ES) of the LMDP from the Golden Triangle to Luang Prabang (Figure 4). The ES will set priorities for an environmental management plan to be integrated within the LMDP. The LMDP would be the most significant development of the Mekong River since the proposed mainstream hydropower projects in Lao PDR and Cambodia. The ES supports the findings of the 'CEPF Status and Distribution

of Freshwater Biodiversity in Indo-Burma' that calls for targeted ecological studies of freshwater species in the upper mainstream Mekong River to determine the impacts of navigation development.

The project also supports CEPF recommendations to integrate aquatic biodiversity and biodiversity surveys into SEA/environmental impact assessment (EIA) processes in the Mekong region. This ES also responds to concerns raised by Mekong River Commission (MRC) member countries, donors and development partners that the cumulative and trans-boundary impacts of the LMDP and Pak Beng HPP require comprehensive assessment. The MRC Navigation Programme (NAP) 'Master Plan on Regional Navigation 2015' recommended that an independent assessment of the LMDP be completed

Figure 4: Study area for the ES of the LMDP



#### 3.1.1 Revised scope of the ES

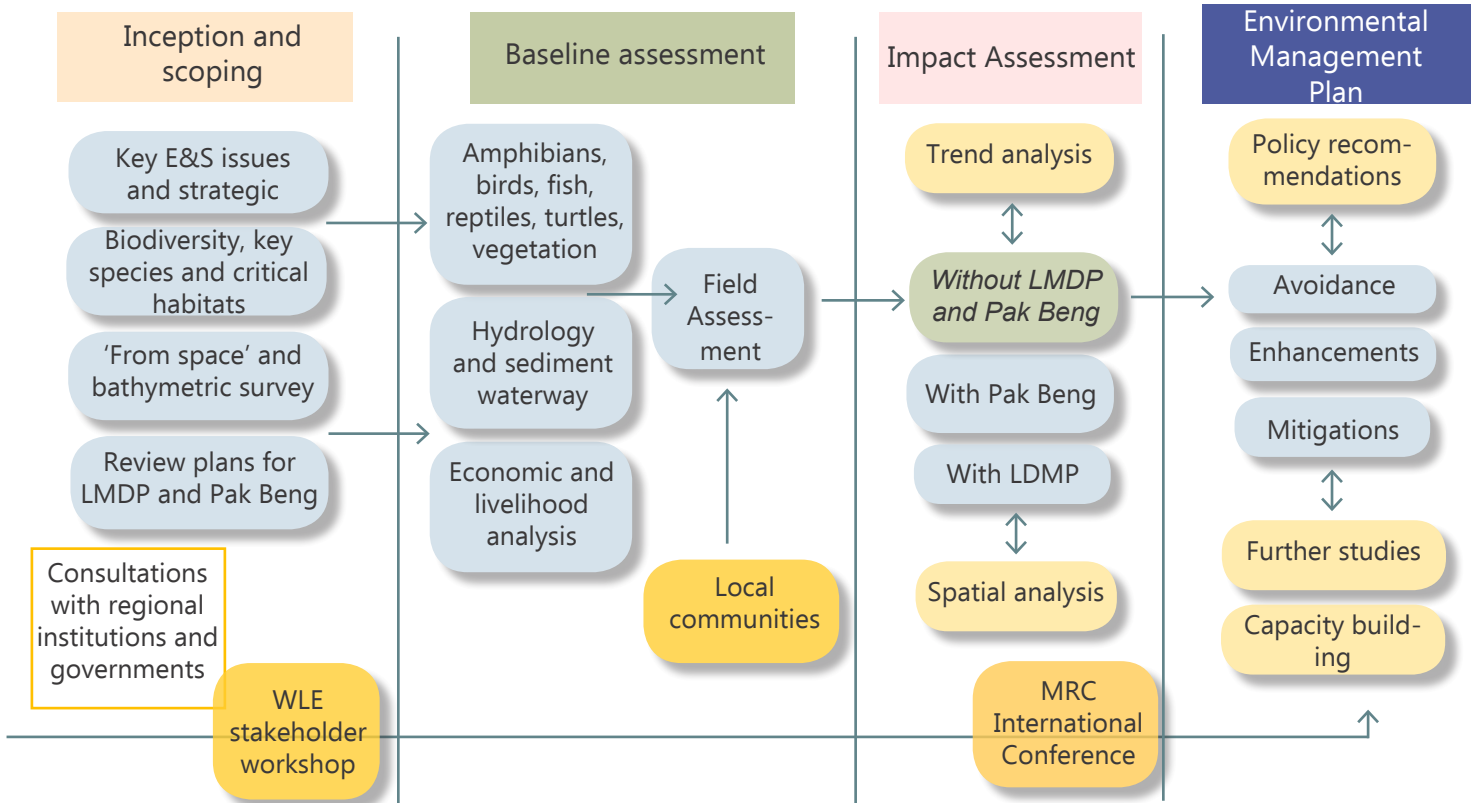
The original scope of the study has been revised to include the impacts of the Pak Beng HPP reservoir. The objectives of the ES are to develop an integrated biodiversity assessment to determine the impacts of rapid and shoal improvement, port construction and increased shipping associated with the LMDP

and the Pak Beng HPP on biodiversity and critical habitats between Golden Triangle and Luang Prabang. The ES builds on past research and has engaged stakeholders, civil society and research institutes to determine the cumulative impacts of the LMDP.

**The following four phases (Figure 5) were adopted to implement the ES:**

- 1 Scoping:** What are the key issues for biodiversity and river basin development between Golden Triangle and Luang Prabang?
- 2 Baseline:** What are the trends in the key issues without the LMDP and Pak Beng HPP?
- 3 Impact:** What are the impacts of the LMDP and Pak Beng HPP on each of these trends?
- 4 Avoidance, mitigation and enhancement recommendations:** How will the most important risks be avoided or mitigated, and the benefits be enhanced?

**Figure 5: Assessment phases and steps**



**3.1.2 Geographic scope**

The geographic scope of the study is the stretch of river between Chiang Saen and Luang Prabang, divided into three assessment zones:

- 1** Chiang Saen to Thai-Lao border (a few km's upstream of Pak Tha)
- 2** Pak Tha to Pak Beng HPP dam site
- 3** Pak Beng HPP dam site to Luang Prabang

**3.1.3 Key issues for biodiversity and navigation developments**

The inception and scoping phase carried out between July and October 2017 identified the key issues for biodiversity and navigation developments between the Golden Triangle and Luang Prabang, including the initial spatial analysis, data and literature review and design of field assessments for each of the key themes of the study:

- ✓ Hydrology and sediment;
- ✓ Fish;
- ✓ Birds;
- ✓ Amphibians and reptiles;
- ✓ Aquatic ecology and wetlands;
- ✓ Waterways; and
- ✓ Socio-economics and livelihoods.

**References**

Allen, D.J., Smith, K.G., and Darwall, W.R.T. (Compilers). 2012. The Status and Distribution of Freshwater Biodiversity in Indo-Burma. Cambridge, UK and Gland, Switzerland: IUCN. x+158pp+4pp cover.

Kunming Engineering Corporation Limited. 2015. Pakbeng hydropower project: SIA - Social Impact Assessment. Kunming Engineering Corporation Limited. Kunming, China. Accessed (October 07, 2018).

MRC, 2018. Development of Guidelines for Hydropower Environmental Impact Mitigation and Risk Management in the Lower Mekong Mainstream and Tributaries. Volume 4 – Final Case Study Report: Mainstream Dams Assessment Including Alternative Scheme Layouts. Initiative for Sustainable Hydropower, Mekong River Commission Secretariat.

MRC, 2018. Guidelines for Transboundary Environmental Impact Assessment in the Lower Mekong Basin. Working document.

