

Lancang River Hydropower Development and Eco-environment Protection

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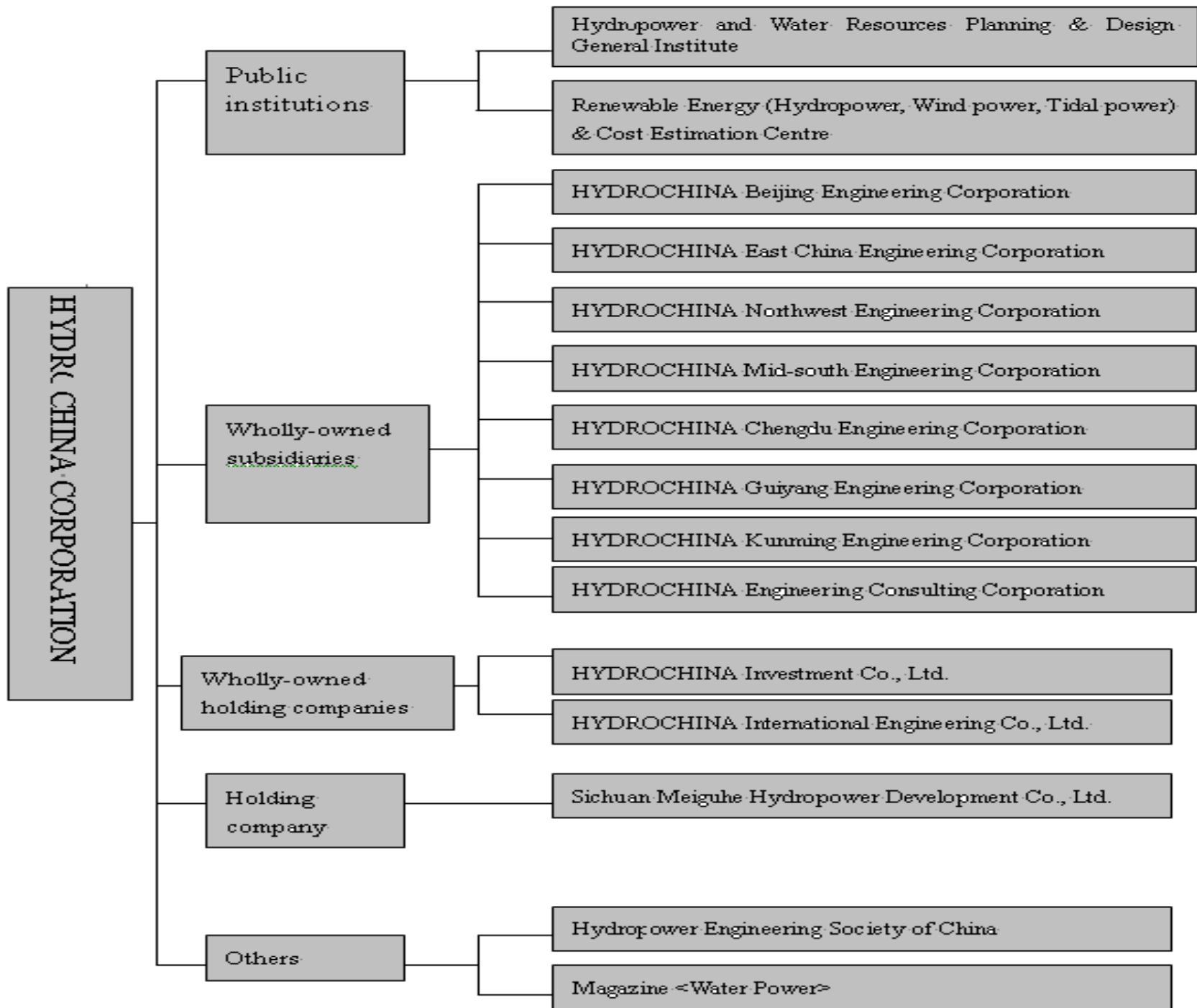
HYROOCHINA CORPORATION



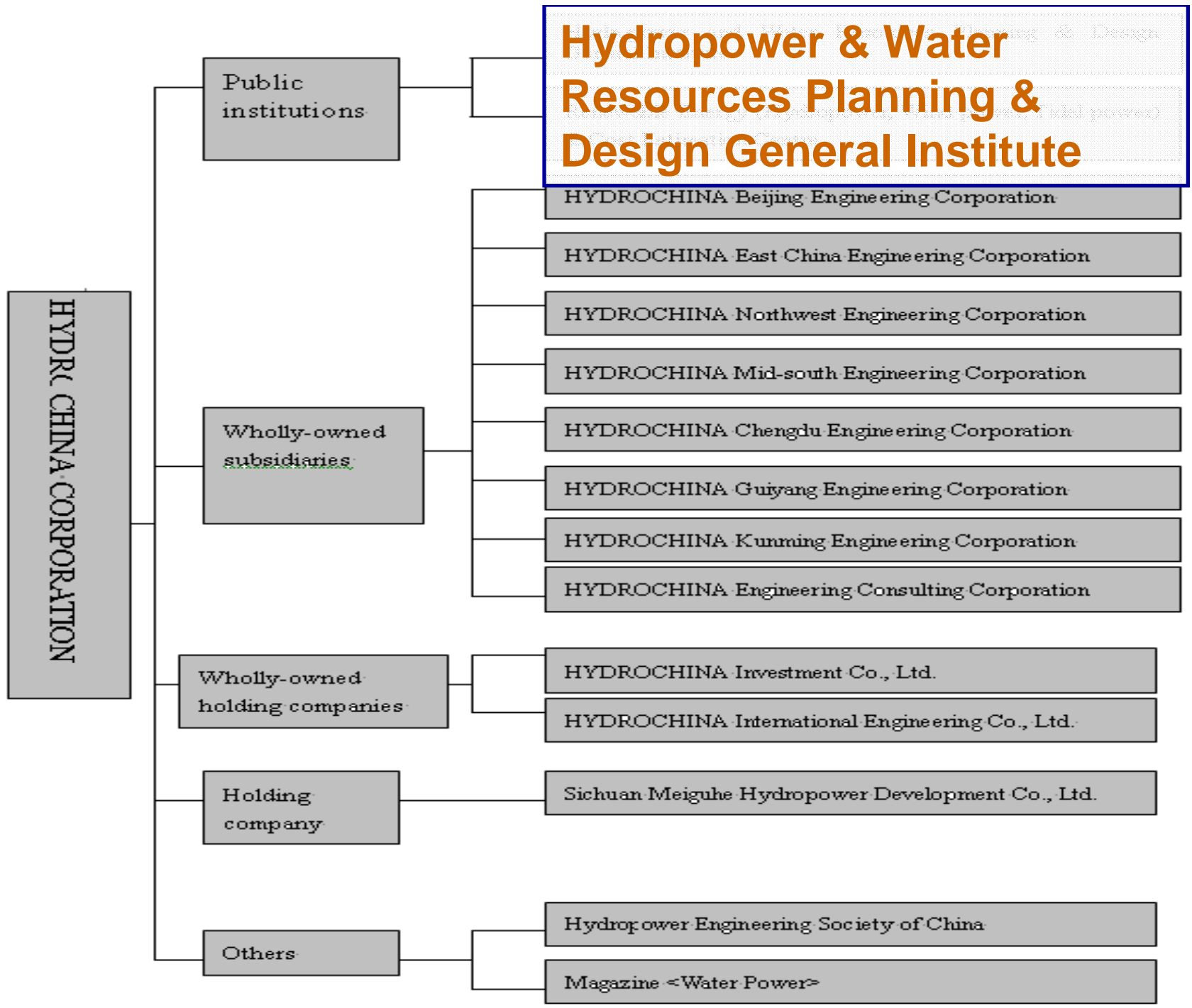
**Regional Multi-Stakeholder Consultation on MRC's
Hydropower Program
Vientiane, Lao PDR, 25-27 September 2008**

Outline

- 1、 About us
- 2、 General Situation of Lancang-Mekong River
- 3、 Hydropower Planning and Development
- 4、 Environment Protection in Hydropower Development
- 5、 Main Research Results of Eco-environment Impacts



- State-owned enterprise (formerly named as China Hydropower Engineering Consulting Group Co., CHECC)
- 50-year full vitality development
- 11 wholly-owned subsidiaries and 1 holding company
- 8 national design masters and investigation masters, 3423 senior engineers, 2112 engineers, 11000 full time staffs
- The total installed capacity of hydropower projects and wind power projects invested by HYDROCHINA is more than 3,800 MW
- Ranked the first or the second in "Top 60 Engineering & Contractor Firms in China" by Engineering News -Record of the USA and "Construction Times" of China respectively since 2003



Our Main Responsibilities on Hydropower & Wind Power Development Management


 National macroscopic policy study on development of hydropower and wind power


 National Hydropower and wind power resources survey and results release

 Management of national river basin hydropower development planning

 Management of national wind power development planning

Our Main Responsibilities on Hydropower & Wind Power Development Management

 Instituting national hydropower & wind power standards for planning, investigation, design, construction, etc.

 Engineering examination and check, including the approval of the pre-feasibility and feasibility study productions

 Acceptance for hydropower and wind power projects, including river division, reservoir first storing, engineering completion, etc

 Management of Engineering Cost, including Final accounting after completion

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2.1 General Introduction

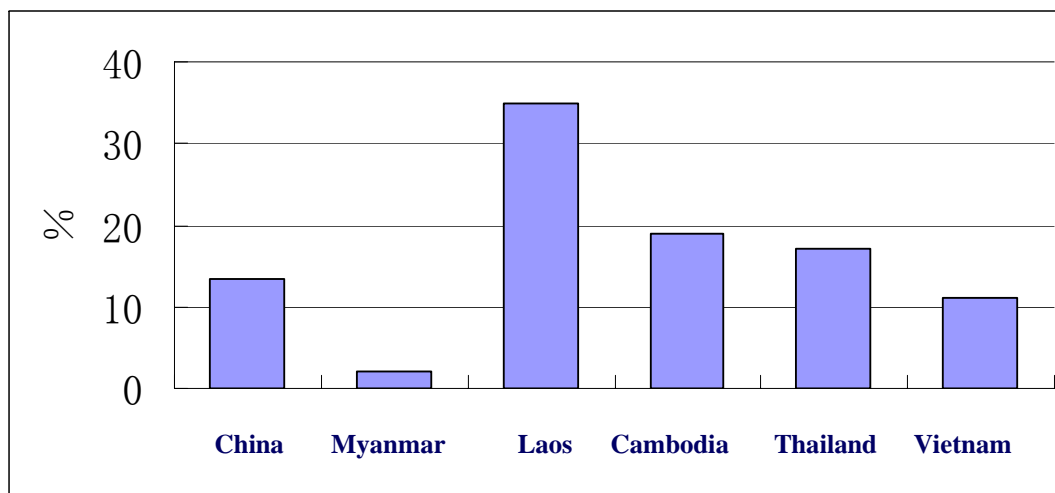
Lancang River originates from Qinghai province, China, it flows across the Qinghai, Tibet and Yunnan, goes out of the boundary at the Mengla country, Xishuangbanna prefecture, Yunnan Province. After that it is changed into another name, Mekong river. Mekong river runs through Myanmar, Laos, Thailand, Cambodia, Vietnam, before entering the South China Sea in a delta south of Ho chi minh City, Vietnam.




2.2 Basic Characters

 Lancang-Mekong River Extends approximately 4880km, Lancang River (the section of which in China) is about 2160km , about **44% of the total length, 90% of the total fall, 23.5% of total catchment area.**

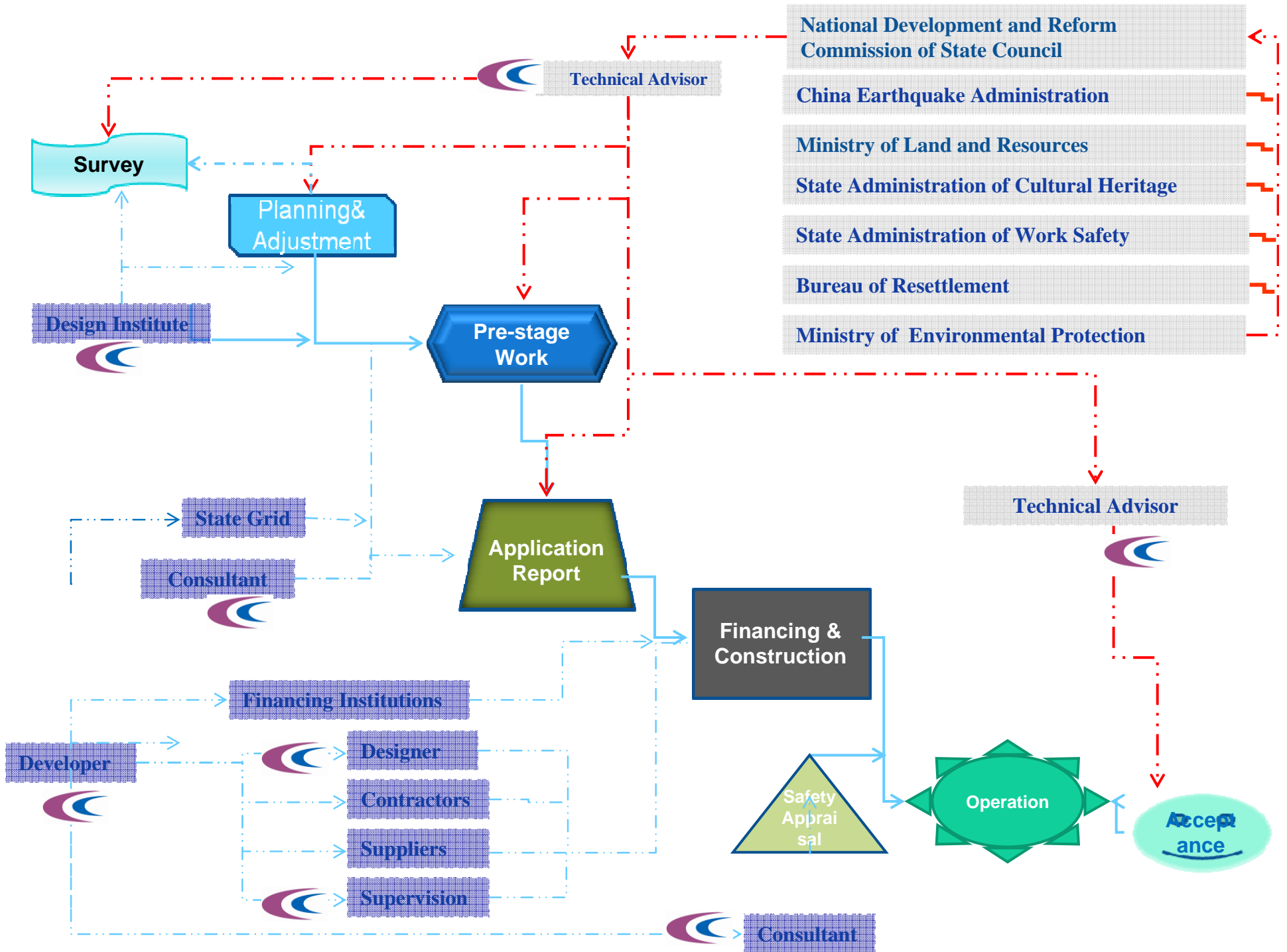
Runoff Percentage of related countries



 The average annual means runoff volume of Lancang River at the boundary is approximately 64 billion m³ (only **13.5%** of that at the sea outlet)

Outline

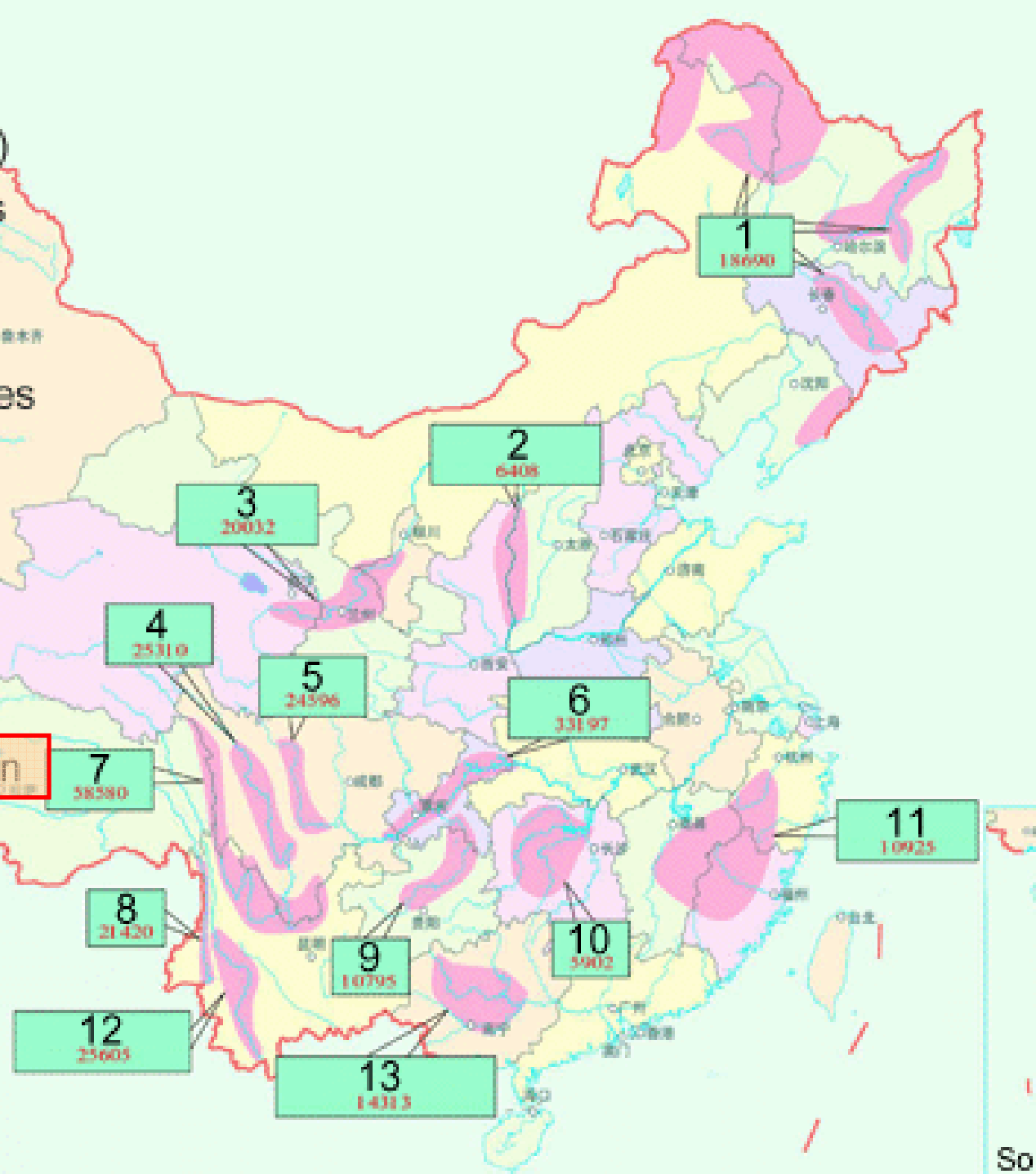
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1. Northeast
2. Yellow River Main (North)
3. Yellow River Up Reaches
4. Yalongjiang River
5. Daduhe River
6. Yangtze River Up Reaches
7. Jinshajiang River
8. Nujiang River
9. Wujiang River
10. West Hunan
11. Fujian Zhejiang Jiangxi

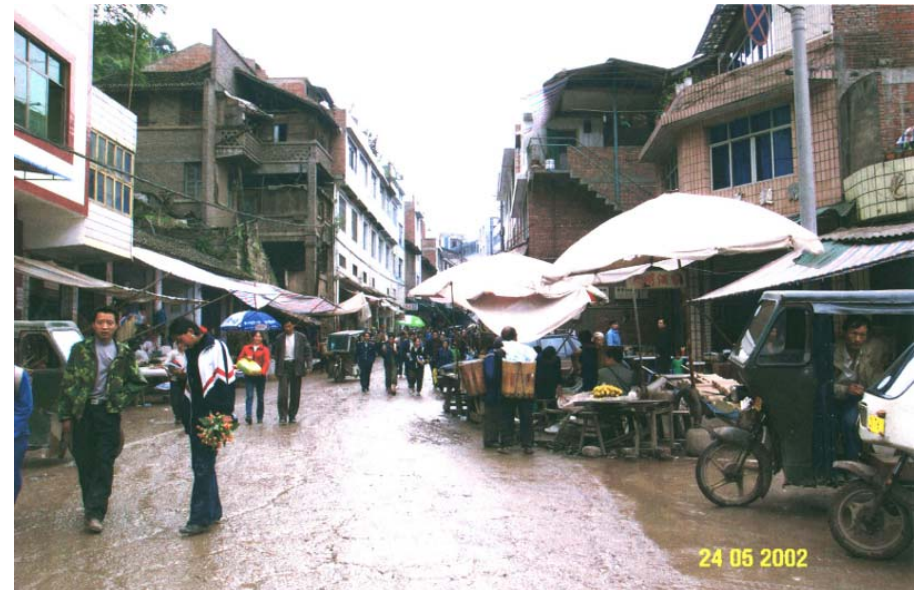
12. Lancangjiang River Mian
13. Nanpanjiang River and Hongshuihe River

Total: 275773
(Installed cap. > 50MW)



➤ Lancang River is one of the 13 Hydropower bases planned in China.

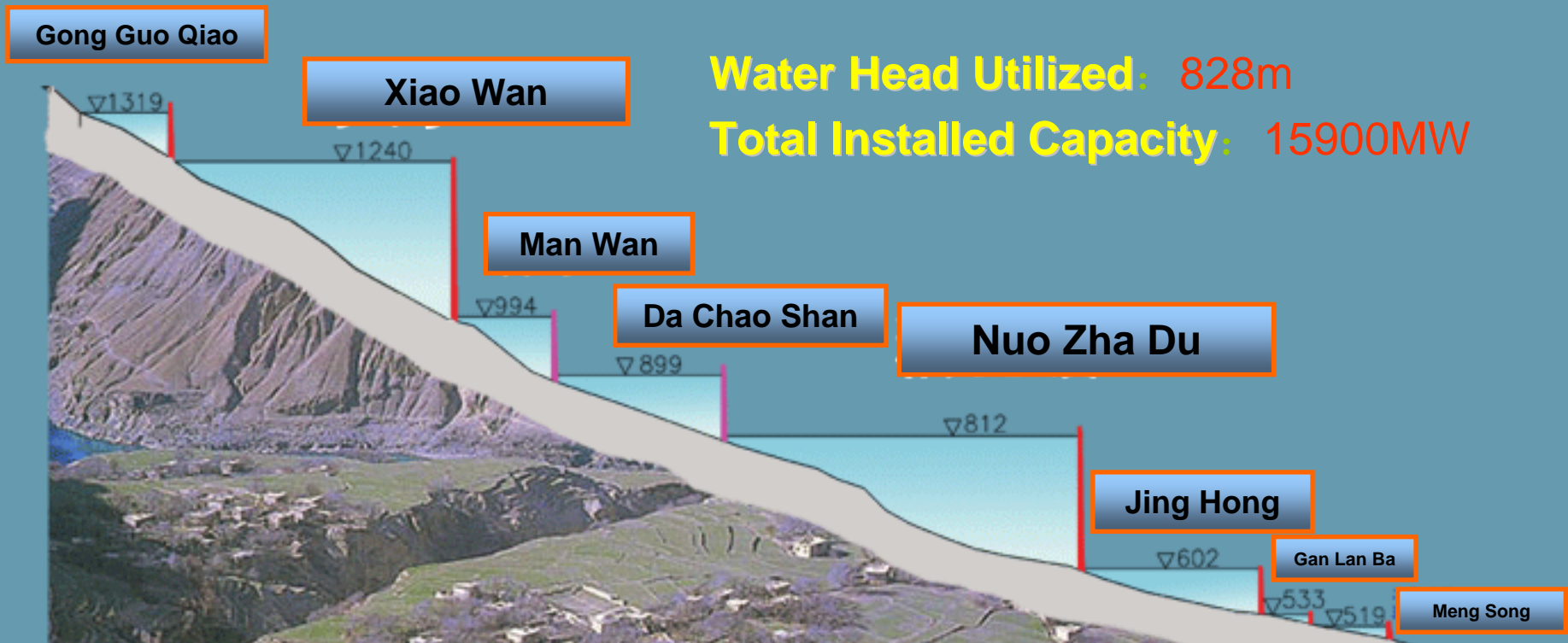
➤ Hydropower is important to local economic and social development.



3.1 Hydropower Planning

- ☞ The Lancang river in Tibet is called upper reach, middle reach is from boundary of Tibet and Yunnan to Miaowei. The development of hydropower on upper and middle reach of the river is under planning.
- ☞ The lower reach is from Miaowei down to the boundary is being developed at present. The planning is composed of 8 cascades with 2 large reservoirs. The total installation capacity is 15900MW and yearly generation electricity is 72.53 billion kWh.

Approved Cascade Development on lower reach of Lancang River



Development scheme : 8 cascades with 2 large reservoirs


Tasks : Electricity generation mainly, navigation, flood control and water supply

Development scale : total installation capacity 15900MW, yearly electricity generation 72.53 billion kWh.


Outline

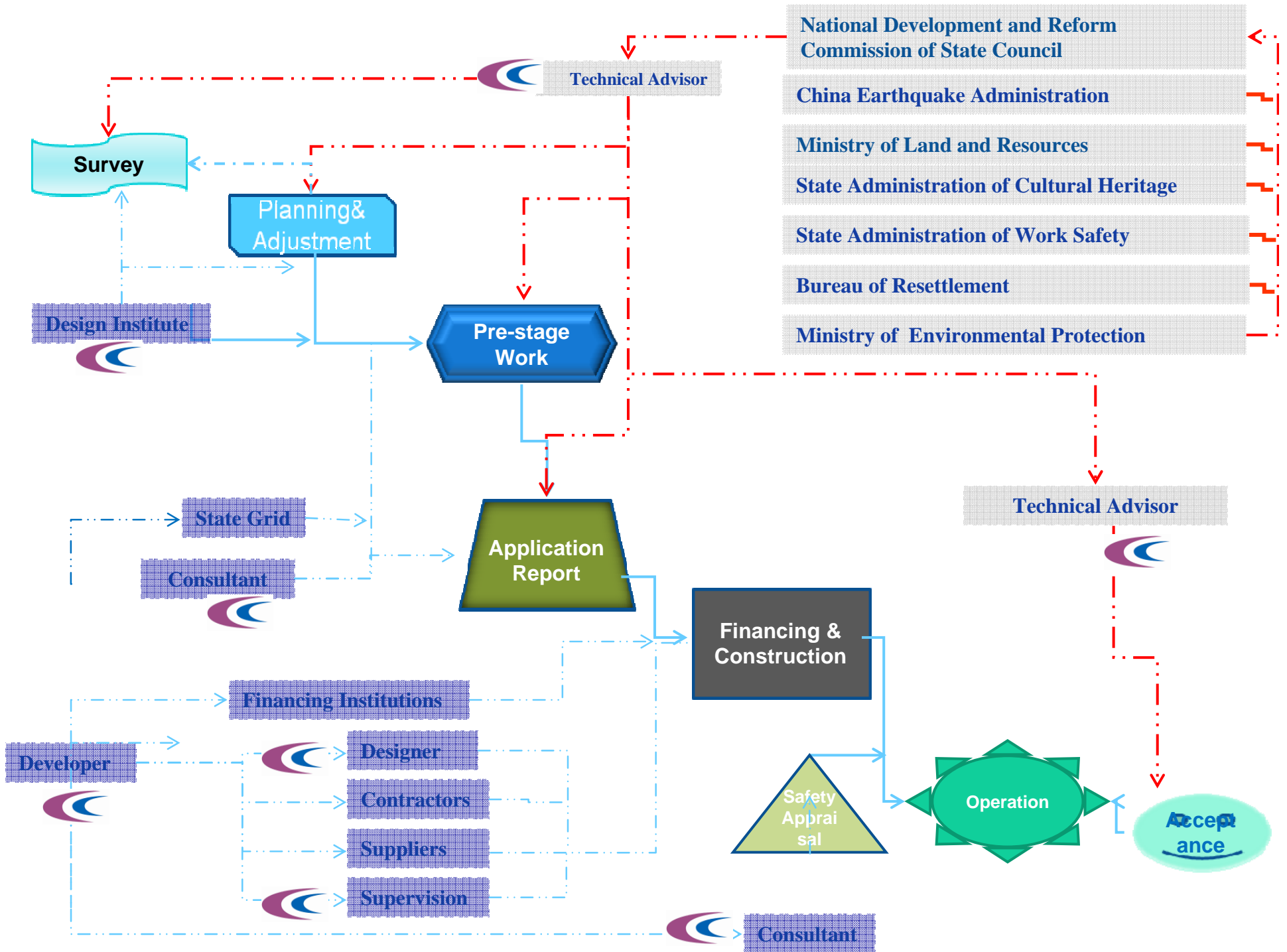
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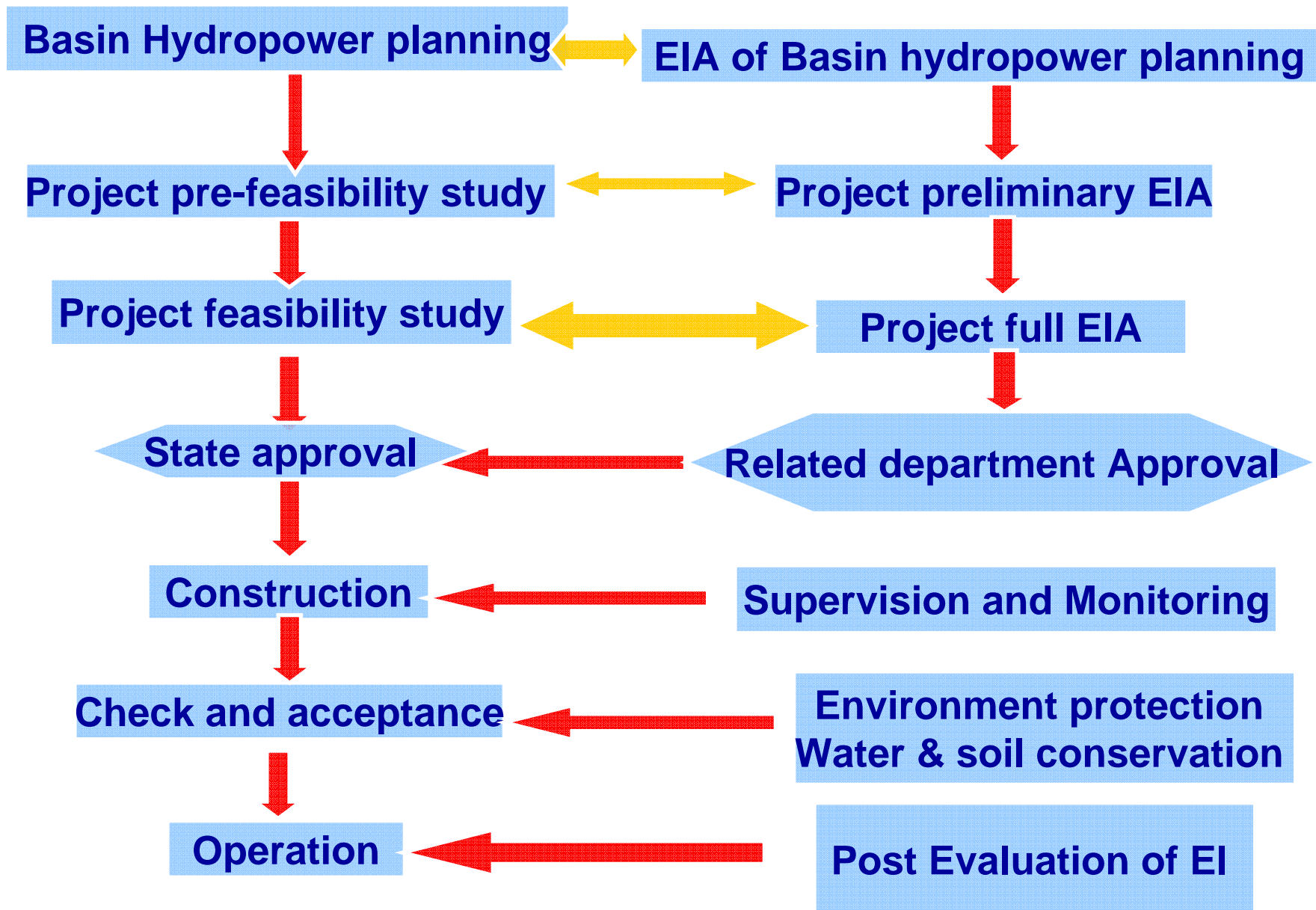
Environmental protection legislation and project approval system

 Perfect environmental management system and an environmental law and code system

 Strict specifications on management procedures of hydropower development

 Specify the environmental management requirements for all the stages of hydropower development





Environment Protection Measures on Lancang River Hydropower Development:

Environment Management in pre-stage work Period

➤ EIA for river basin hydropower **planning**, taking environment protection into consideration, comparing, improving and deciding the planning scheme.

➤ Preliminary EIA for project **pre-feasibility study**, identifying the important environmental impacts, and bringing forward corresponding protection scheme;

Environment Protection Measures on Lancang River Hydropower Development:

Environment Management in pre-stage work Period

- Full EIA for project **feasibility study**, analyzing the impact sources, pre-evaluating the important impacts, conducting planning & design for environmental protection
- The EIA results or documents should be **approved** by government.

Environment Protection Measures on Lancang River Hydropower Development:

Environment Management in Construction Period

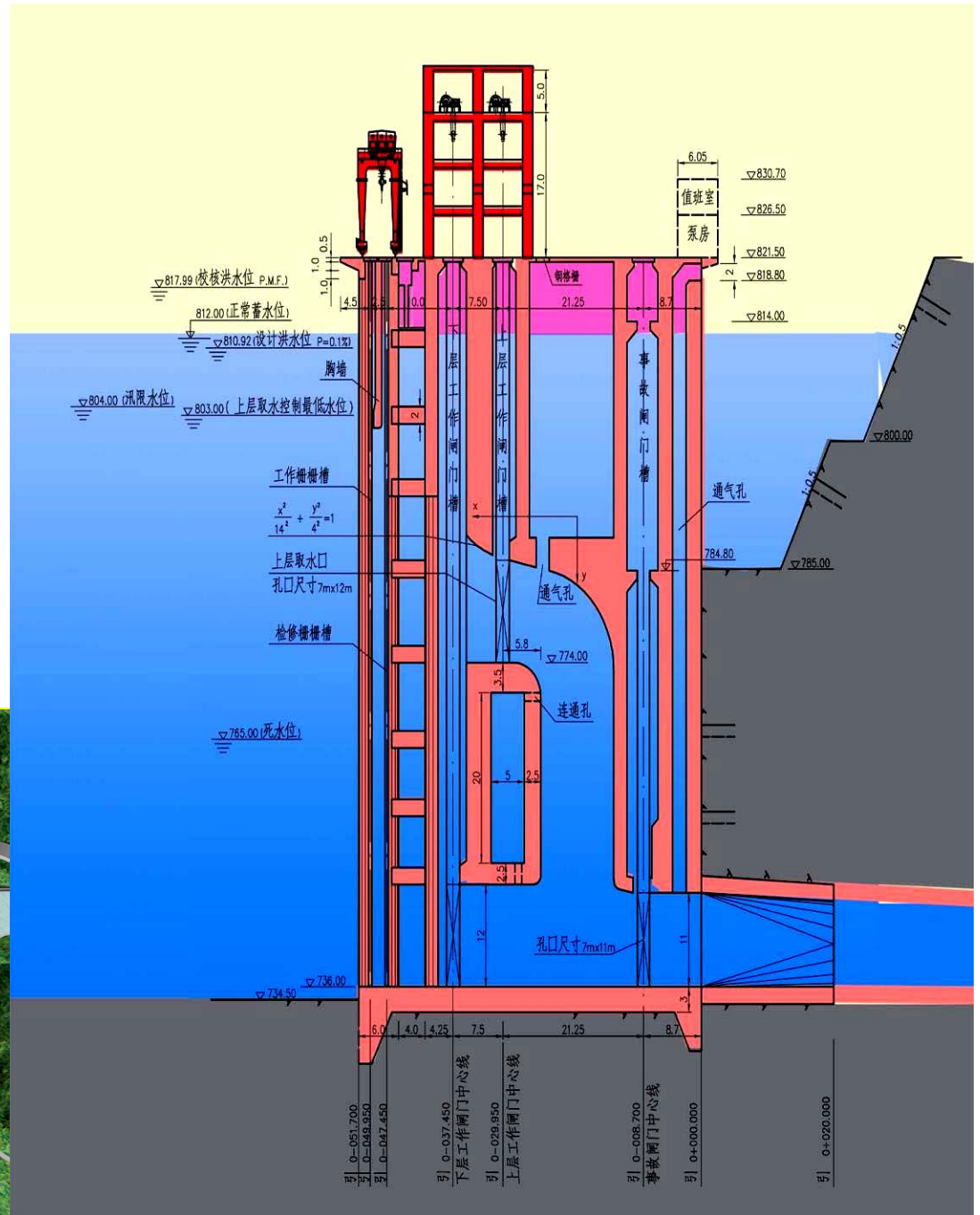
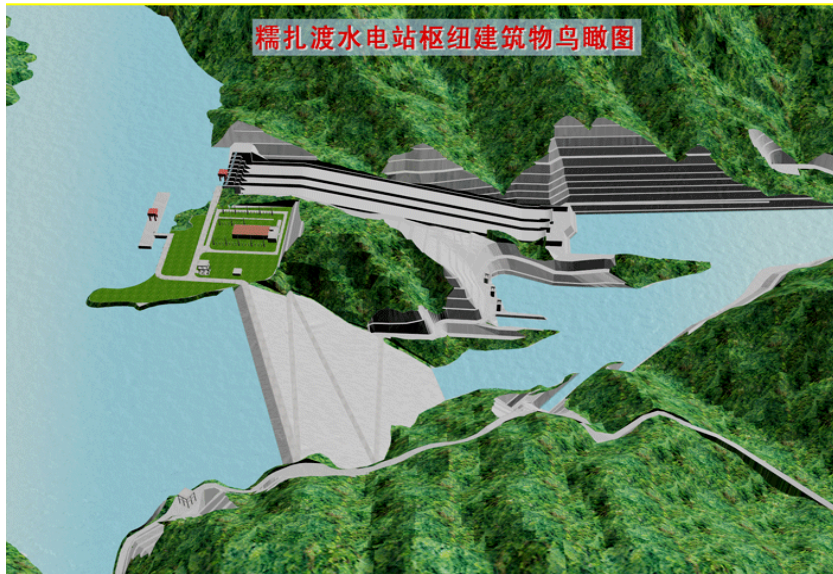
- Production and living wastewater treatment, air pollution and noise prevention;
- Soil and water conservation, virescence;
- Reservoir bottom cleanness;
- Environmental protection supervision and monitoring;
- Special check & acceptance of environmental protection and water & soil conservation

Environment Protection Measures on Lancang River Hydropower Development:

Environment Management in Operation Period

- cascade reservoirs seasonal operation, eco-environmental basic flow discharge, downstream water level fluctuation control;
- Multi-level power intake, to reduce cold water impacts if needed;
- Artificial fish proliferation and release, rare fish conservation
- Rare plants and animals protection;
- Post evaluation of EI and related improvement.

Structure Profile of Multi-level Intake in Nuozhadu Hydropower Station



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5.1 Research work conducted

China pays fully attention to Eco-environment impacts of Lancang River hydropower development.

(1) The Research and assessment on Eco-environment and downstream impacts of Lancang River hydropower development, jointly conducted by **HYDROCHINA** and China Institute of Water Resource & Hydropower Research.

(2) The Research on cross-boundary impacts and its countermeasures of Lancang River hydropower development, done by Asian International River Center of **Yunnan University**.

5.1 Research work conducted

(3) Special research on downstream impacts of Lancang River hydropower development, conducted by Duron Environment Scientific Consulting Co. Ltd of Canada.

5.2 Research Results of Downstream Impacts

- (1) Lancang River hydropower development will not affect downstream water volume ;**
- (2) Some impacts on downstream sediment movement;**
- (3) No barrier impacts on migratory fishes;**
- (4) Benefits for downstream flood control, irrigation and water supply;**

5.2 Research Results of Downstream Impacts

(5) No obvious impacts on downstream flow regime at present, because of the small reservoir volume of existing Manwan, Dachaoshan and Jinghong hydropower stations.

The cascades regulated capacity will increase with the completion of Xiaowan and Nuozhadu hydropower stations.

It will reduce Lancang River runoff volume of the border in wet season, but increase it in dry season.

5.2 Research Results of Downstream Impacts

As a whole, such changes will have limited impacts on downstream flow patterns, because runoff volume of Lancang River covers only 13.5% of that of Mekong River at the sea mouth.



Thank You !

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