

*Transboundary Water
Management
in the Lancang-Mekong River*

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KARMI Conference
4 December 2021

Outline

- Introduction
- Mekong River Basin & History
- Geopolitics
- Mekong River Commission
- Hydropower Dams
- Lancang-Mekong Cooperation
- Concluding Remarks

Introduction

- Research purpose
 - To evaluate the overview of critical issues in the Mekong River Basin with special reference to hydropower development
 - To highlight the complexity of interactions between the riparian countries in the era of the MRC-the LMC mechanism
- Rationale
 - Hydropower development → an engine for growth but issue for controversy
 - Mekong River Basin usually regarded as a hotspot of conflict but a source for regional cooperation between the upstream and the downstream countries

Mekong River Basin

- Mekong River Basin
 - Flowing through 6 countries: China, Myanmar, Laos, Vietnam, Thailand & Cambodia
 - Divided into Upper Mekong and Lower Mekong Basin
- Hydrologic regime
 - Monsoon climatic conditions: Lower MK, 1,672mm
 - Flood season: June ~ Nov/Dec, 85-90% of precipitation concentrated
- Potential hydropower energy source
 - Energy demand in MKRB, i.e. in Thailand & Vietnam
 - Thai economic growth: 4.0% in 2017, 4.13% in 2018 (WB data)
 - Vietnam economic growth: 6.8% in 2017, 7.1% in 2018 (WB data)

Overview of Mekong River Basin

Items	Contents
Length	4,800 km (10 th biggest river in the world based on mean annual flow at the mouth)
Catchment area	795,000 km ²
Annual rainfall	900/1000 mm – 1,600/1,700 mm (Yunnan) 1,500 mm (Thai subbasins) – 3,000 mm (Central Highlands of Lao PDR)
Total population	Over 70 million (2008)
Riparian states	China (Upper River Basin), Myanmar, Laos, Thailand, Vietnam, Cambodia (Lower River Basin)
Upper River Basin	<ul style="list-style-type: none">• 24% of the total area• 15-20% contribution to water flow• steep & narrow, soil erosion problems• little development of major tributaries
Lower River Basin	<ul style="list-style-type: none">• 76% of the total area• 75-80% contribution to water flow• contribution to major wet season flow• hydropower potential (Laos, left bank)• overexploitation of land for irrigation (Thai, right bank)

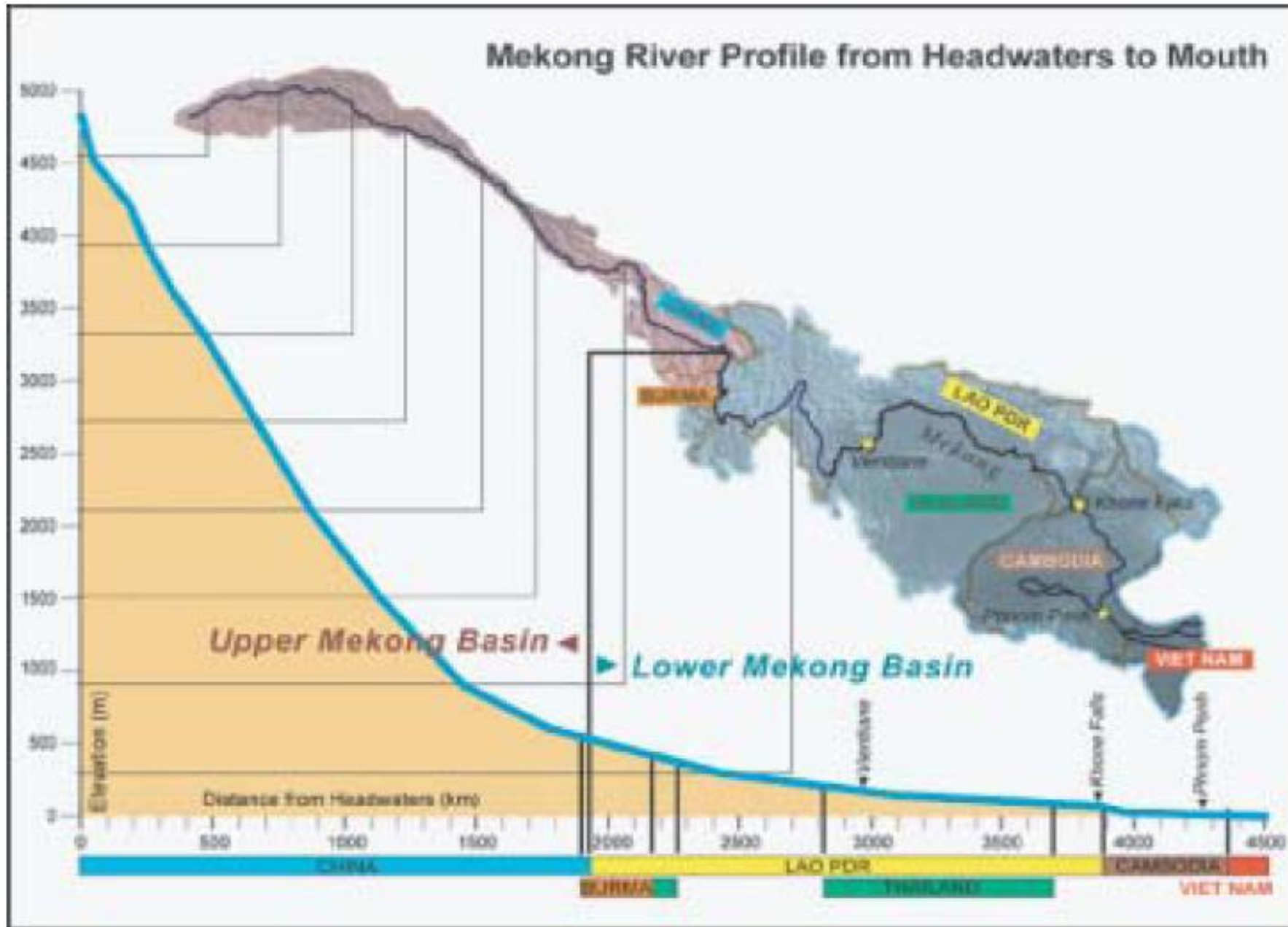
Mekong River Basin

- Wetland & aquatic ecosystems
 - Linked to ecological balance & economic activities
 - Major habitats for fish: 1 mil tons of fish per year
 - 1,200 different fish species in the basin (Giant Catfish, weighing 100-120 kg)
 - A source of food & jobs for 70 million people
- Tonle Sap in Cambodia
 - Productive fishing ground: 850 fish species
 - The largest freshwater lake in Southeast Asia → important for Cambodia's economy



Mekong River Basin

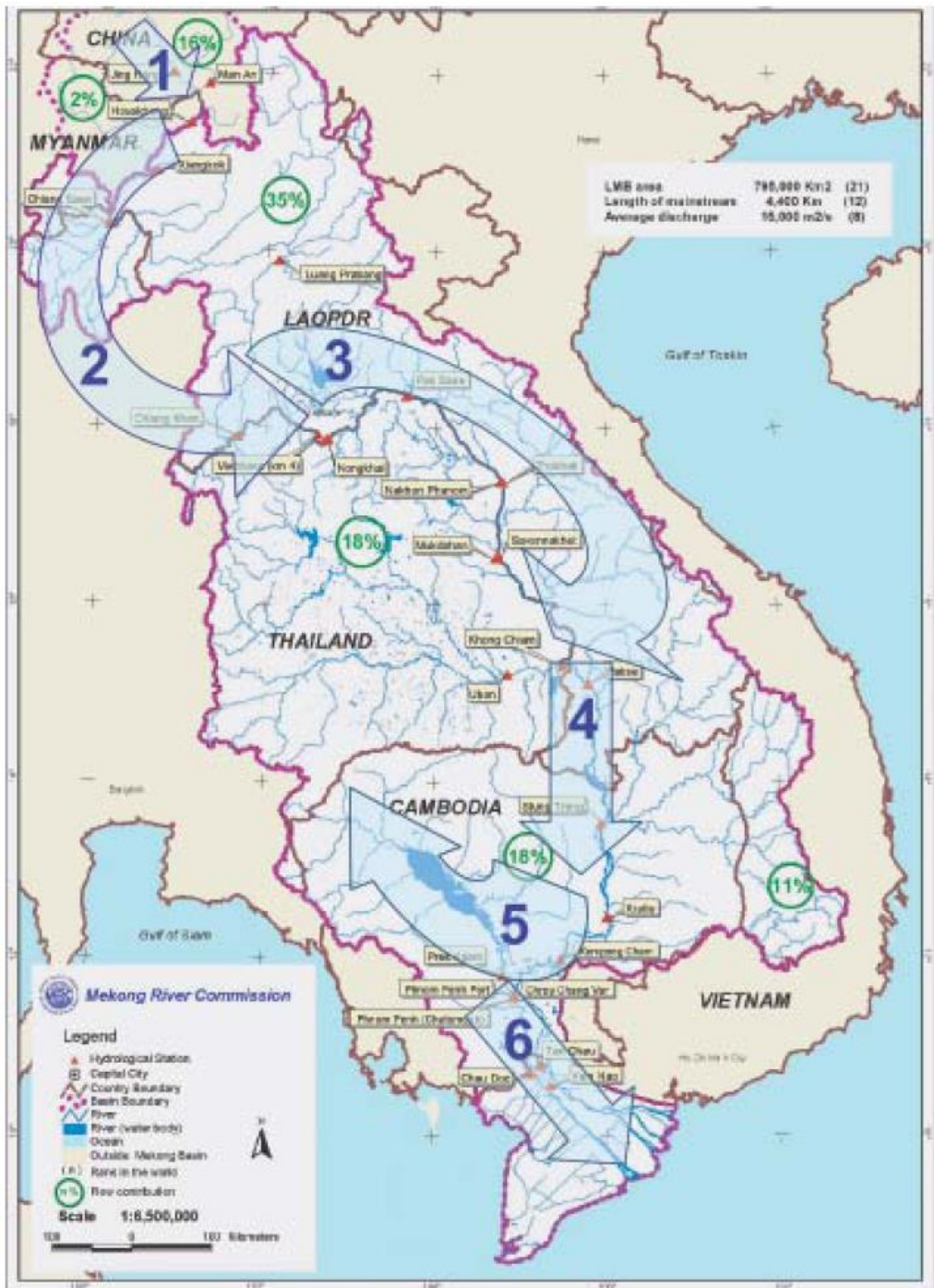
Source: MRC: An Introduction to MRC Procedural Rules



Geography of Mekong River Basin

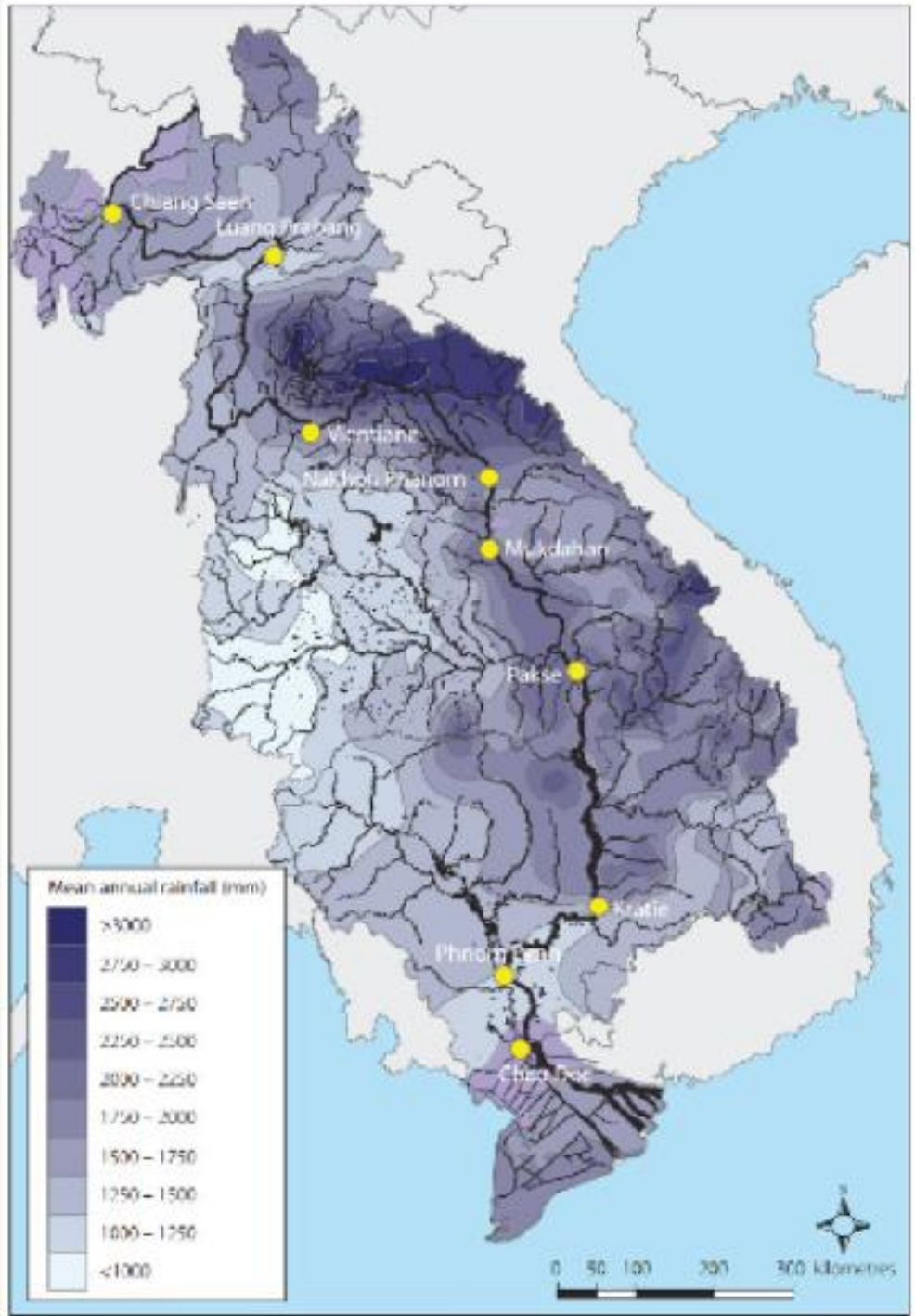
Source: MRC (2005) *Overview of the Hydrology of the Mekong Basin*.

Major Geographical River Zones & Flow Contribution in the Mekong River



Country	Flow Contribution (%)
China	16
Myanmar	2
Laos	35
Thailand	18
Vietnam	11
Cambodia	18
Total	100

Source: MRC (2005) *Overview of the Hydrology of the Mekong Basin*



Precipitation Patterns in the Lower Mekong Basin

Source: WWF (2016) Mekong River in the Economy.
<http://www.mrcmekong.org/assets/Uploads/mekong-river-in-the-economy-final.pdf>

History

- Vietnam War (1955-1975) & continuous conflicts
 - A Cold War division: Vietnam, Laos & Cambodia
 - Tension between Thailand & Laos: 1988 border conflict (Vietnam supported its communist ally, Laos)
- 1991, the Paris Peace Agreement
 - Official end of Cambodia-Vietnam War (1975 to 1988)
 - Vietnamese army withdrawal from Cambodia → reduction in tension
- 1995 the Agreement on Cooperation for the SD of the MKB signed in Thailand
 - A set up of the [Mekong River Commission](#)
 - To follow the principle, 'equitable utilization'
- 2015 Launch of the Lancang-Mekong Cooperation (LMC) mechanism
 - All Mekong riparian countries participating
 - A new era begun based on new rules of the game China

Geopolitics

- Yunnan, China (no MRC member)
 - Uncooperative with the downstream countries but changing attitude
 - Hydropower development: little information, no transparency, no stakeholder engagement in decision-making process
 - *Lancang Mekong Cooperative Mechanism* launched in 2015
- Myanmar (no MRC member)
 - Little concern for sustainable resource management
 - More attention to Salween and Irrawaddy Rivers for hydropower
- Laos
 - Largest hydropower potential, competing with China
 - Construction of several dams in the Mekong River & its tributaries
 - Natural resources management for maximum optimization

Geopolitics

- Thailand
 - Industrialization: forest cover loss & environmental pollution
 - Growth of NGOs: SEARIN (Southeast Asia International Rivers Network) & TERRA (Towards Ecological & Regional Alliance)
 - Import of hydropower from Laos by financing dams
- Cambodia
 - The Tonle Sap system: agricultural & fisheries production
 - 50% of its GDP from agriculture, fisheries & forestry in MKB
- Vietnam
 - Mekong Delta, 50% of rice & 40% of total agricultural output
 - World's leading rice production & export country → threatened by sea level rise, triggered by climate change
 - Resource management, low priority than economic growth

Geopolitical Issues in the Mekong River Basin

Country	Major Issues	Others
China	<ul style="list-style-type: none"> • Observer status • Hydropower dams (15 dams planned, 6 dams in operation) 	<ul style="list-style-type: none"> • More cooperation due to economy since 2010 • <i>Lancang-Mekong Cooperation Mechanism</i> since 2015
Myanmar	<ul style="list-style-type: none"> • Little concern for resource management 	<ul style="list-style-type: none"> • More attention to Salween and Irrawaddy Rivers for hydropower development
Laos	<ul style="list-style-type: none"> • Largest hydropower potential, competing with China • Construction of 9 dams planned in MK & tributaries 	<ul style="list-style-type: none"> • Construction of Xayaburi Dam, controversial (conflict with Vietnam) in March 2011 • PNPCA mechanism of MRC first tested
Thailand	<ul style="list-style-type: none"> • Industrialization, escalation of forest cover loss & environmental pollution in the basin 	<ul style="list-style-type: none"> • Growth of NGOs, SEARIN (Southeast Asia International Rivers Network) & TERRA (Towards Ecological & Regional Alliance) • Hydropower broker in the region
Vietnam	<ul style="list-style-type: none"> • Mekong Delta, 50% of rice & 40% of total agricultural output • World's No.1 rice production & export country 	<ul style="list-style-type: none"> • Resource management, low priority • Dispute with Laos for Xayaburi Dam in 2011 for fear of low water flow & sediment
Cambodia	<ul style="list-style-type: none"> • The Tonle Sap system, essential for agricultural & fisheries production 	<ul style="list-style-type: none"> • 50% of GDP from agriculture, fisheries, forestry in MK basin

Mekong River Commission

- Institutional Backbone: **1995 the Agreement on Cooperation for the SD** of the MKB signed in Thailand
 - To facilitate development & use of natural resources
 - To follow the principle, 'equitable utilization'
- Structure & functions
 - Laos, Thailand, Vietnam, Cambodia: full members
 - China, Myanmar: observer status → *fragile coalition*
 - Mekong Committee 1957, Interim Committee 1978, MRC 1995
 - The Agreement on Cooperation for SD of the MKRB
 - 3 permanent bodies: Council, Joint Committee & Secretariat
 - *Basin Development Plan*: to balance economic development & environmental protection → development scenarios, IWRM-based strategy, structural/non-structural investment

Mekong River Commission



Cambodia



Lao PDR



Thailand



Viet Nam

Council

Policy making body

Joint Committee

Management body

Secretariat

Operational body

Dialogue Partners



China



Myanmar

Mekong River Commission Decision Making Structure & Countries involved

Source: MRC: An Introduction to MRC Procedural Rules

Mekong River Commission

- Structure & functions (continued)
 - Development of minimum monthly flows with a requirement to prevent daily average peaks greater than what naturally occurs in flood season
 - **The Procedure for Notification, Prior Consultation & Agreement (PNPCA):** countries do not have a veto right (to stop a dam being built in a neighboring country) yet countries cannot proceed without consultation
- Challenge
 - An absence of China & Myanmar: lack of political legitimacy
 - Lacking the power to tackle the final outcomes, only monitoring, data collection & planning → weak law enforcement
 - The unevenness of state-level interests and power
 - State-centrism rather than sub-state level actor-focused

Chinese Dams

- Completion of 11 dams among 15 planned since 1993
 - Most recent: Nuozhadu Dam, 2012
 - More dams in pipeline in the further upstream of China
- Xiaowan Dam
 - Completed in 2012, the 2nd largest power project after 3GD with the budget of over US\$ 4 billion
 - The 2nd largest of the 8 dams (world's tallest – 292 meter, 4.2GW electricity cf. 18.3GW by 3GD)
- Critiques
 - Trapping sediment: total 50% for downstream
 - Destruction of fishery industries: Tonle Sap in Cambodia
 - Counterargument: sediment trapping only affected further down to north of Vientiane, water pollution, overexploitation of fishery already underway

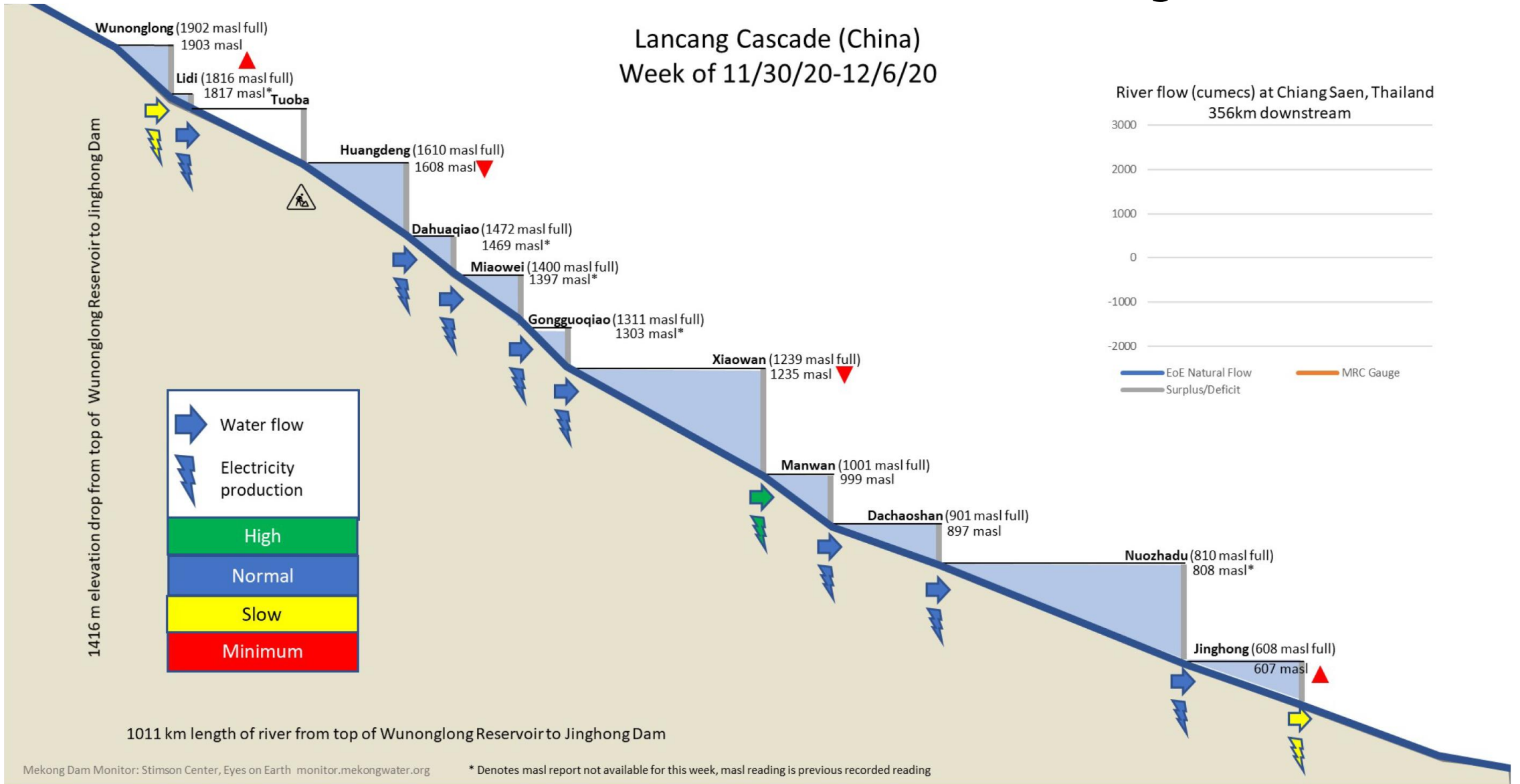


Xiaowan Dam in Lancang River

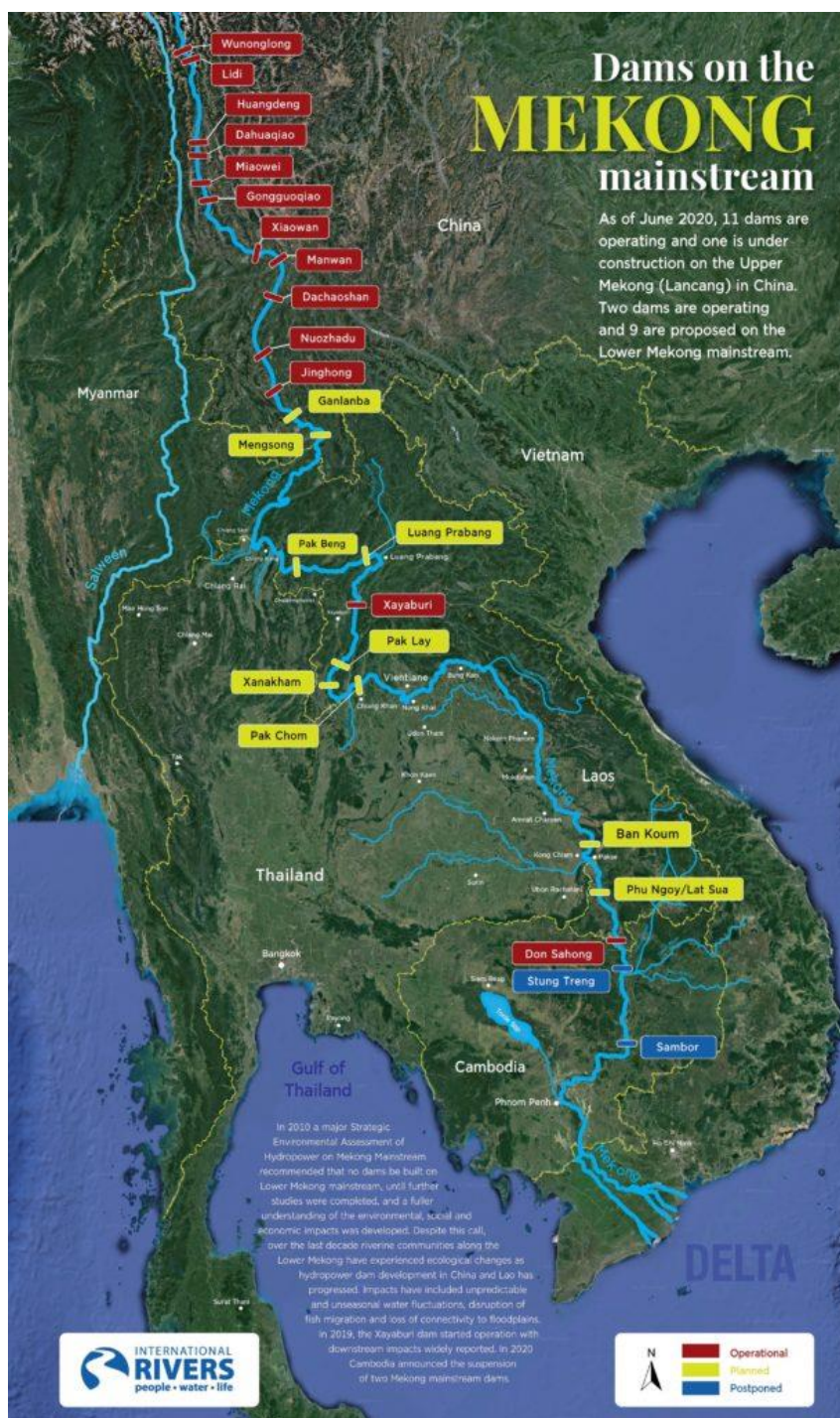
Source: Hortle, K.G. and So Nam (2017) *Mitigation of the Impacts of Dams on Fisheries: A Primer*. Mekong Development Series No. 7. Vientiane, Mekong River Commission.

Profile of the Chinese Dams in the Lancang River

Lancang Cascade (China)
Week of 11/30/20-12/6/20



Source: Mekong Dam Monitor: Stimson Center, Eyes on Earth <http://monitor.mekongwater.org>



Hydropower Dams

- 11 Chinese dams in operation
- More mainstream dams in pipeline by Laos together with Xayaburi and Don Sahong Dams
- Lower Mekong River, no more ‘free flow’

Source: <https://www.internationalrivers.org/where-we-work/asia/mekong/>

Hydropower Capacity of the Mekong Countries (2017)

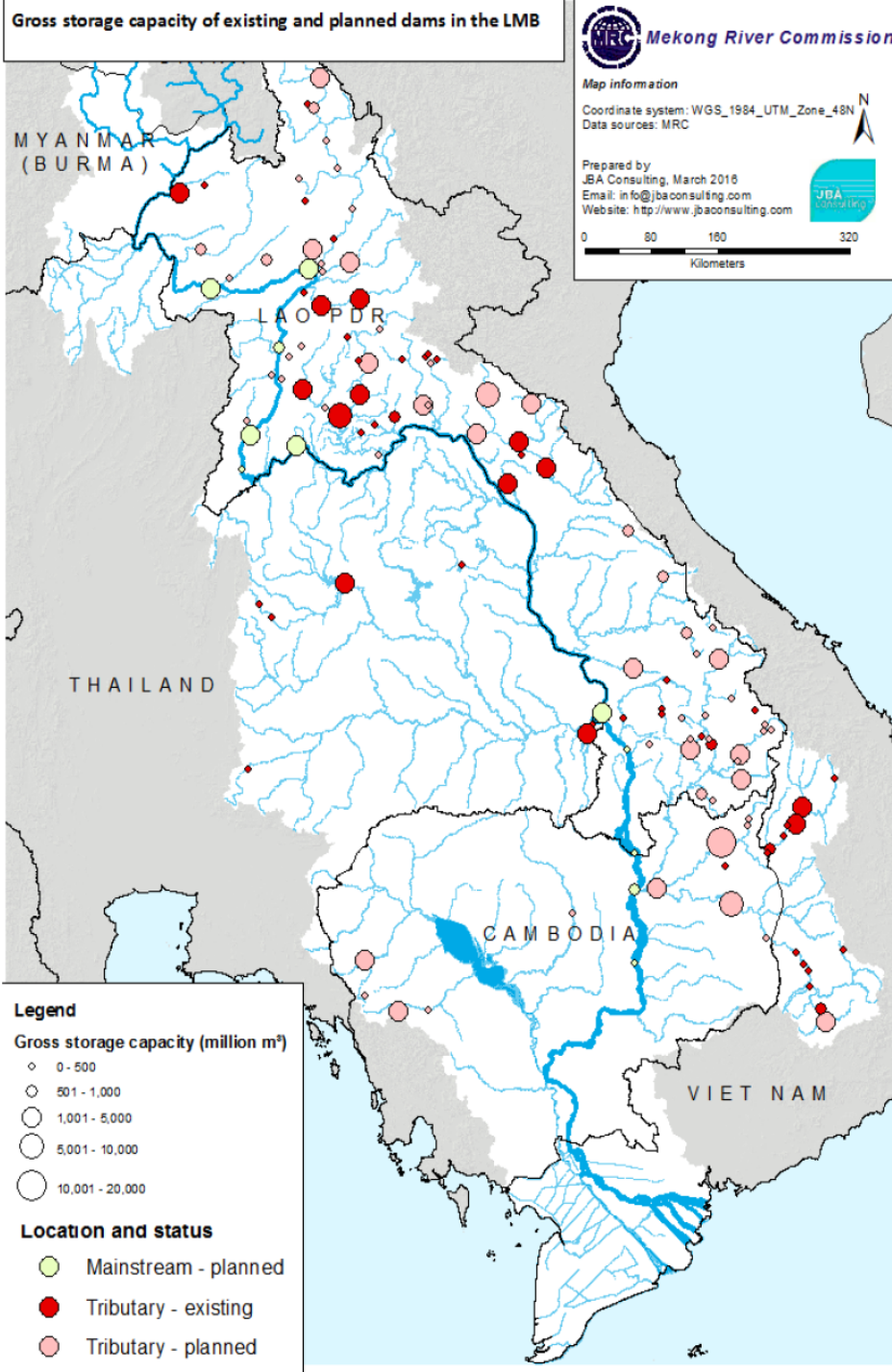
The GMS Countries	Hydropower Installed (MW)	Hydropower Potential (MW)
Yunnan and Guangxi Provinces of China	20,000	122,000
Myanmar	3,100	100,000
Lao PDR	4,100	18,000
Thailand	4,500	4,600
Cambodia	1,300	10,000
Vietnam	15,800	35,000
Total	48,800	289,600

Source: Shin, Nayeon, Lee, Seungho and Hong, Ilpyo (2020) Chapter 6: Regional cooperation through the Greater Mekong Subregion Programme. In Johnston, Charles and Chen, Xin, *Opportunities and Challenges for the Greater Mekong Subregion*. Oxon and New York, Routledge.

Hydropower Dam Plan in the Mekong River Basin

Country	Development 2007			20-Year Plan 2030			Long-Term Plan 2060		
	No	Installed capacity (MW)	Live storage (10 ⁶ m ³)	No	Installed capacity (MW)	Live storage (10 ⁶ m ³)	No	Installed capacity (MW)	Live storage (10 ⁶ m ³)
Lao PDR	11	662.4	5,639.0	56	18,335.7	40,127.5	84	20,271.9	50,273.8
Thailand	7	744.7	3,566.3	7	744.7	3,566.3	7	744.7	3,566.3
Cambodia	1	1.0	0.1	4	4,761.0	2,449.5	11	5,507.0	15,714.5
Vietnam	5	1,104.0	789.8	15	2,583.0	3,155.7	15	2,583.0	3,155.7
China	2	2,900.0	624.0	6	15,450	23,193.0	6	15,450	23,193.0
Total LMB	24	2,512.1	9,995.2	82	26,424.4	49,299.0	117	29,106.6	72,710.3
Total MB	26	5,412.1	10,619.2	88	41,874.4	72,492	123	44,556.6	95,903.3

Source: MRC (2018) *Basin-Wide Assessment of Climate Change Impacts on Hydropower Production*. Vientiane, Mekong River Commission.



Hydropower Projects (existing & planned in 2016) and their gross storage capacities

Source: MRC (2018) *Basin-Wide Assessment of Climate Change Impacts on Hydropower Production*. Vientiane, Mekong River Commission.

China's Investment in Hydropower Projects in the Lower Mekong Countries

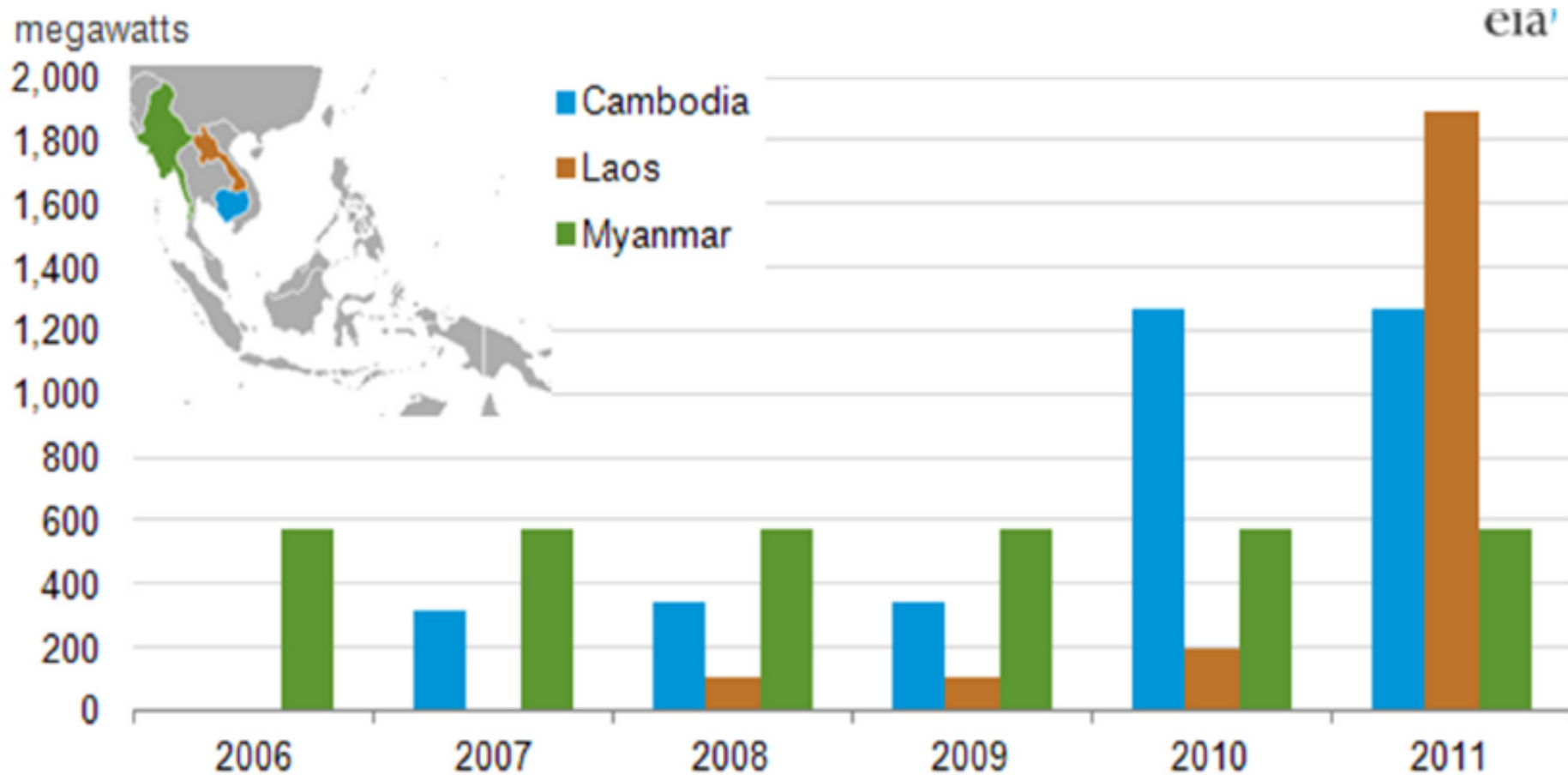
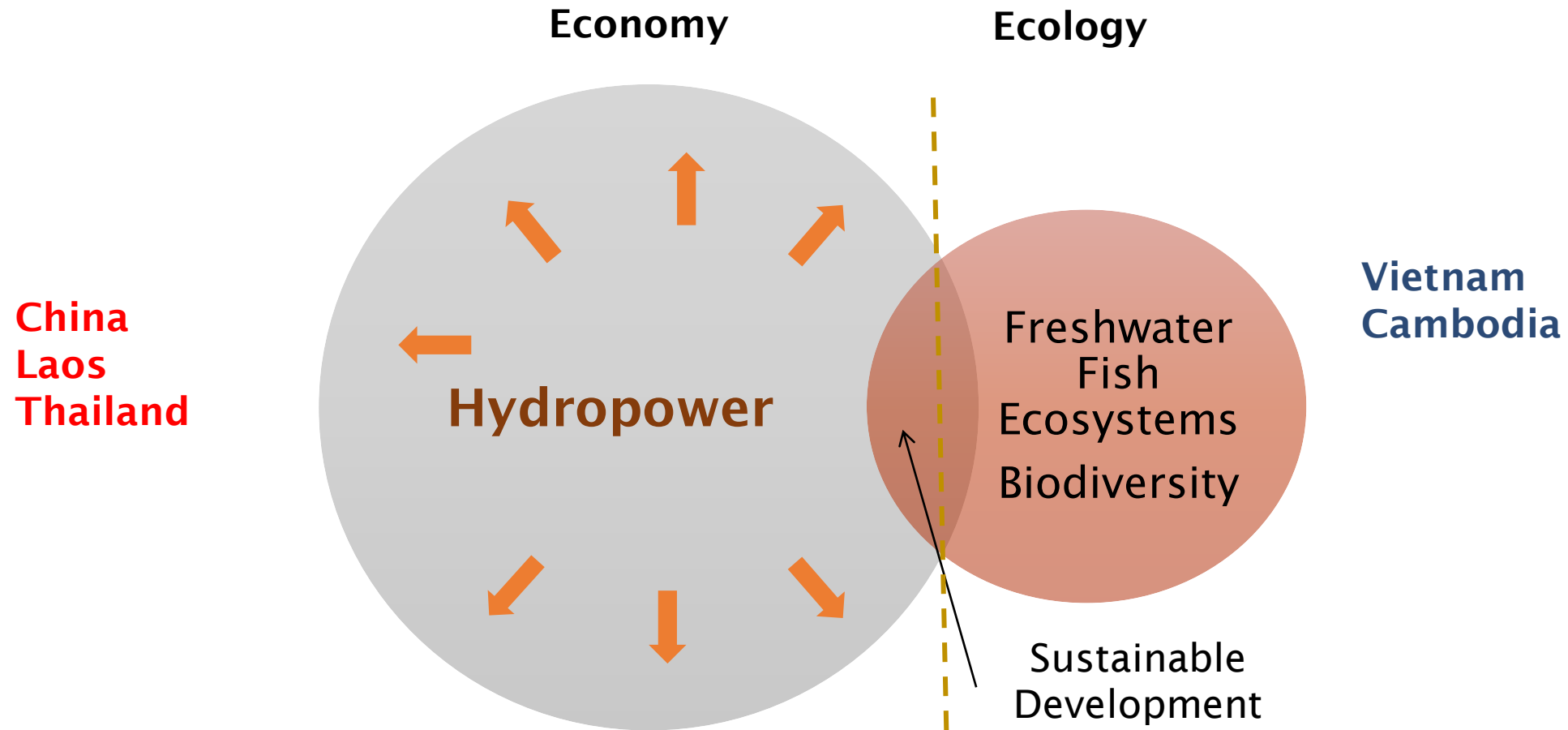


Figure 1. Cumulative hydroelectric capacity additions financed by China (2006–2011)

Source: Matthews, Nathaniel, and Motta, Stew (2020) Chinese State-Owned Enterprise Investment in Mekong Hydropower: Political and Economic Drivers and Their Implications across the Water, Energy, and Food Nexus. *Water* 7, 6269-6284.

Economy-Ecology Nexus



Hydropower development racing overshadows sustainable development in the MK River Basin
➤ **sustainable hydropower development policy needed**

Lancang-Mekong Cooperation

• China's Rules of the Game

- An initiative set up in November 2014 between China and ASEAN in Naypyidaw, Myanmar
- 5 priority areas: 1) interconnectivity; 2) production capacity; 3) cross-border economic cooperation; 4) **water resources**; and 5) cooperation on agriculture & poverty reduction
- Water resources included → further implications?
- 78 early-harvest projects agreed: water resources management, poverty alleviation, public health, infrastructure, personnel exchanges, and science & technology (March 2016)

Lancang-Mekong Water Resources Cooperation Center



Source: <https://news.cgtn.com/news/2020-08-02/Lancang-Mekong-countries-strive-to-deepen-water-partnership-SCCTaVk4ak/index.html> (established in Beijing, 2017)

Lancang-Mekong Cooperation

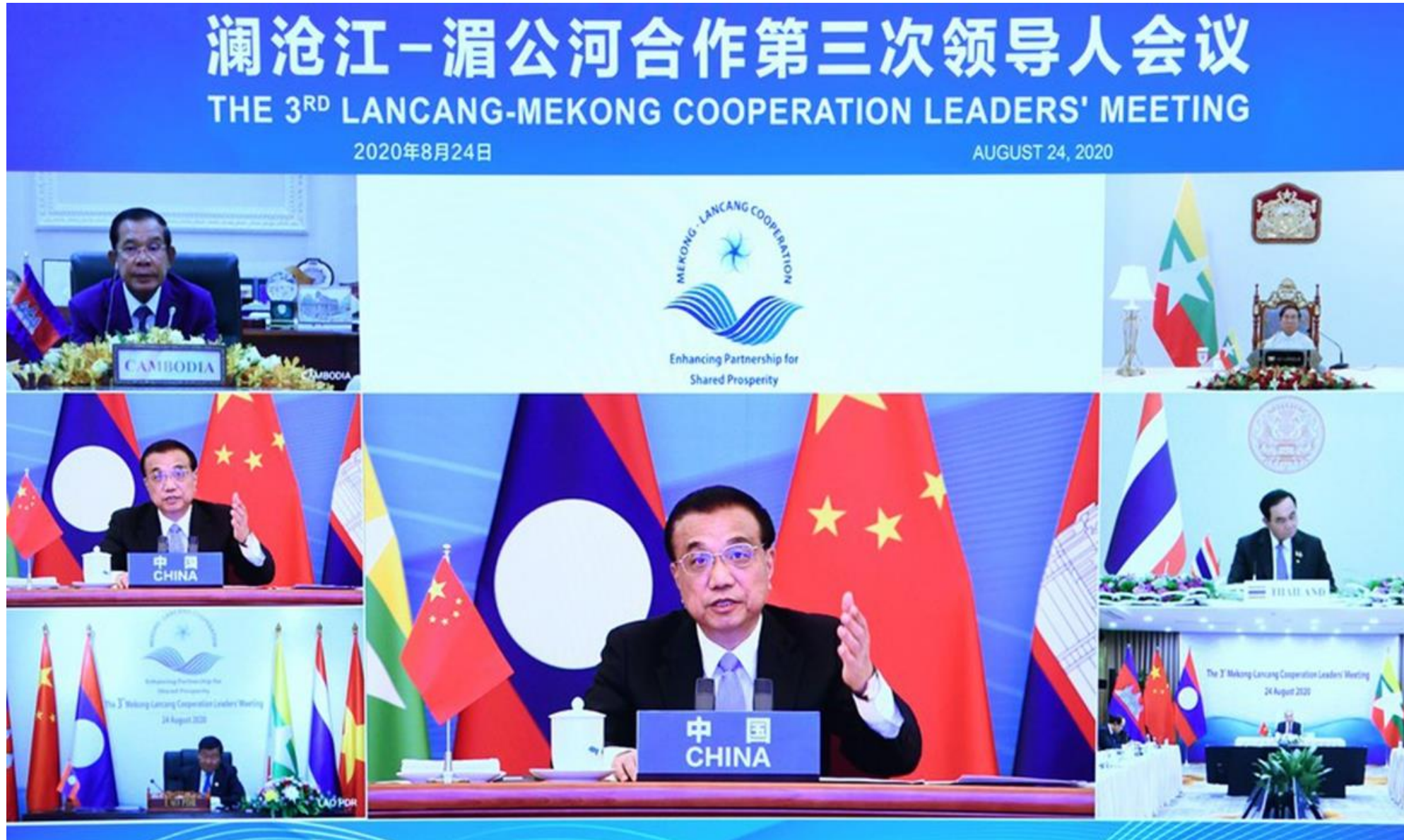
- **Mechanism in Action**

- The 1st action occurred between 15 March and 10 April 2016 → an amount of 2,000 m³/s water released from the Jinghong Dam as an emergency water for drought downstream
- Laos, Vietnam and Cambodia's welcome response
- China's positive engagement with the downstream countries?

- **Critique**

- LMCM, a brainchild of China for establishing a new order in the Mekong River Basin
- Impact of water release, only felt down to the middle reaches
- A bridging stone to connect multi-interests of China with possible projects in pipeline under the umbrella of AIIB and the Belt and Road Initiative (BRI)?

The 3rd Lancang-Mekong Leaders' Meeting, 24 August 2020

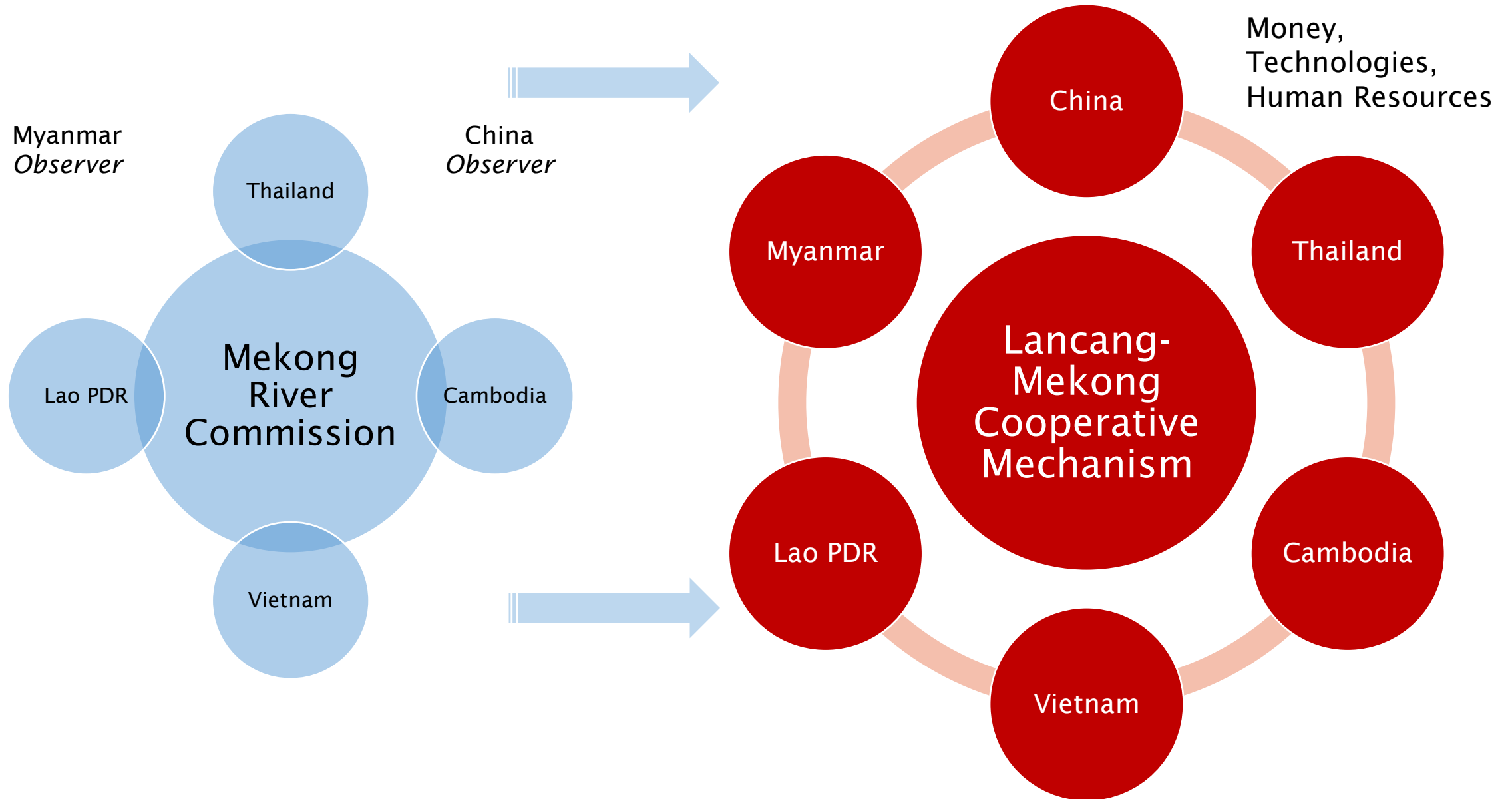


Source: <https://www.globaltimes.cn/content/1198782.shtml> (accessed 16 September 2020)

Lancang-Mekong Cooperation

- 24 August 2020, the 3rd Lancang-Mekong Leaders' Meeting online
 - Premier Li Keqiang attended and presided over the meeting
 - China: more information on the hydrological data on the Lancang River timelier and transparently with the downstream countries for emergency cooperation in response to floods and droughts
 - More requests from the downstream countries on aid for agriculture, poverty alleviation, and farming downstream
 - China's strategic efforts to accommodate requests and needs of the downstream countries, not only about sensitive water issues but also non-water issues – security, resource diversification, socio-economic interests via int'l trade

Cooperation Architecture in the MRB



Southeast Asian Restaurant → Chinese Restaurant?

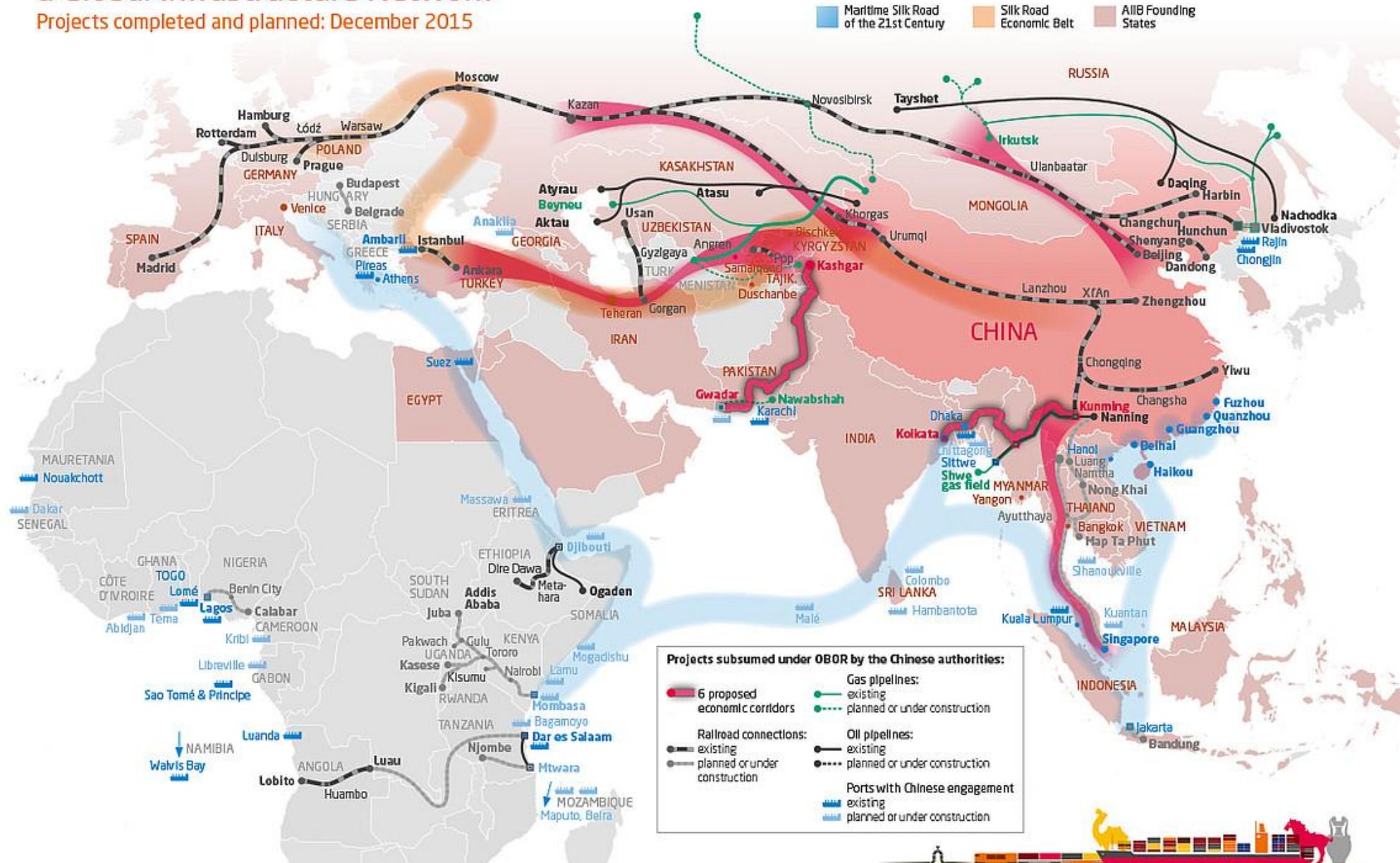
Vientiane, August 2015



Beijing, June 2002

One Belt, One Road: With the Silk Road Initiative, China Aims to Build a Global Infrastructure Network

Projects completed and planned: December 2015



Concluding Remarks

- China and the Lower Mekong countries
 - Lower riparian states' choice → closer ties with China
 - Waning of the influence of the MRC
 - Lancang-Mekong Cooperation Mechanism: game changer?
- Hydropower
 - A key to socio-economic development & energy security
 - Mitigation of hydropower impacts in the middle of fierce hydropower development competition
- China at the negotiation table?
 - The wider cooperation frameworks can offset the benefits incurred through China's unilateral development
 - A good signal for sustainable water management in MRB