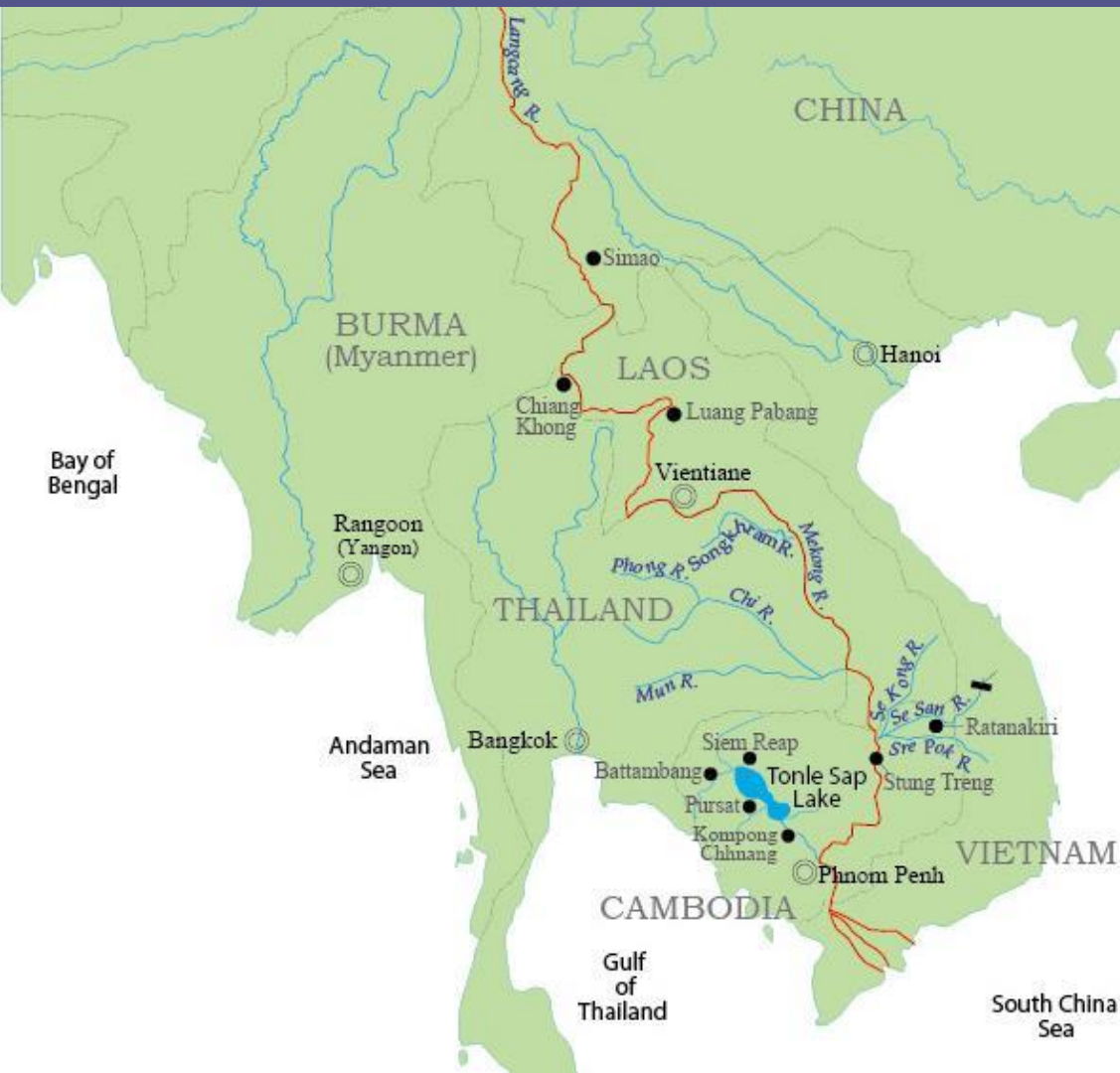


Reconsidering the Development of the Mekong and its Tributaries
ความมั่นคงทางอาหารและการทวนการพัฒนาแม่น้ำโขงและแม่น้ำสาขา
23 February 2016 @ Ubon Ratchahani University

Impacts of Dam Construction on the Mekong - The experience of the Mun River -

Yuka Kiguchi
Mekong Watch

Mekong River



- This international river passes through the six countries; China, Myanmar (Burma), Lao PDR, Thailand, Cambodia, and Vietnam.

Fish Diversity in the Mekong Basin

- 781 fish species are found in the Mekong River (2009).
- The Mekong River is the second river in the world for fish diversity (second only to the 1,271 species of the Amazon River).



Rich fish fauna in the mainstream and tributaries

Location	Species	Families	Endemic
Mekong Mainstream			
China-headwater	24	3	4
China-upper reach	34	4	4
China-middle reach	48	8	7
China-lower reach	122	21	15
Northern Lao PDR	140	30	26
Mekong down Khone Falls	168	34	25
Stung Treng-Kratie	204	37	33
Mekong Delta	486	73	28
Mekong Tributaries			
Nam Ou	72	15	29
Nam Ngum	156	27	43
Nam Mang	57	19	17
Nam Kadingh	99	21	38
Songkhram	216	40	39
Xe Bang Fai	157	31	51
Xe Bang Hiang	160	33	47
Mun/Chi	270	38	49
Sekong	214	33	63
Sesan	133	26	24
Srepok	204	32	38
Thonle Sap Lake	284	45	31

Table: Species Richness in 20 Locations of the Mekong Basin (ICEM 2010: 11)

Benefits from fish

Country	Cambodia	Lao PDR	Thailand	Vietnam	Global Average
%	49.8	38.31	16.19	12.87	5.78

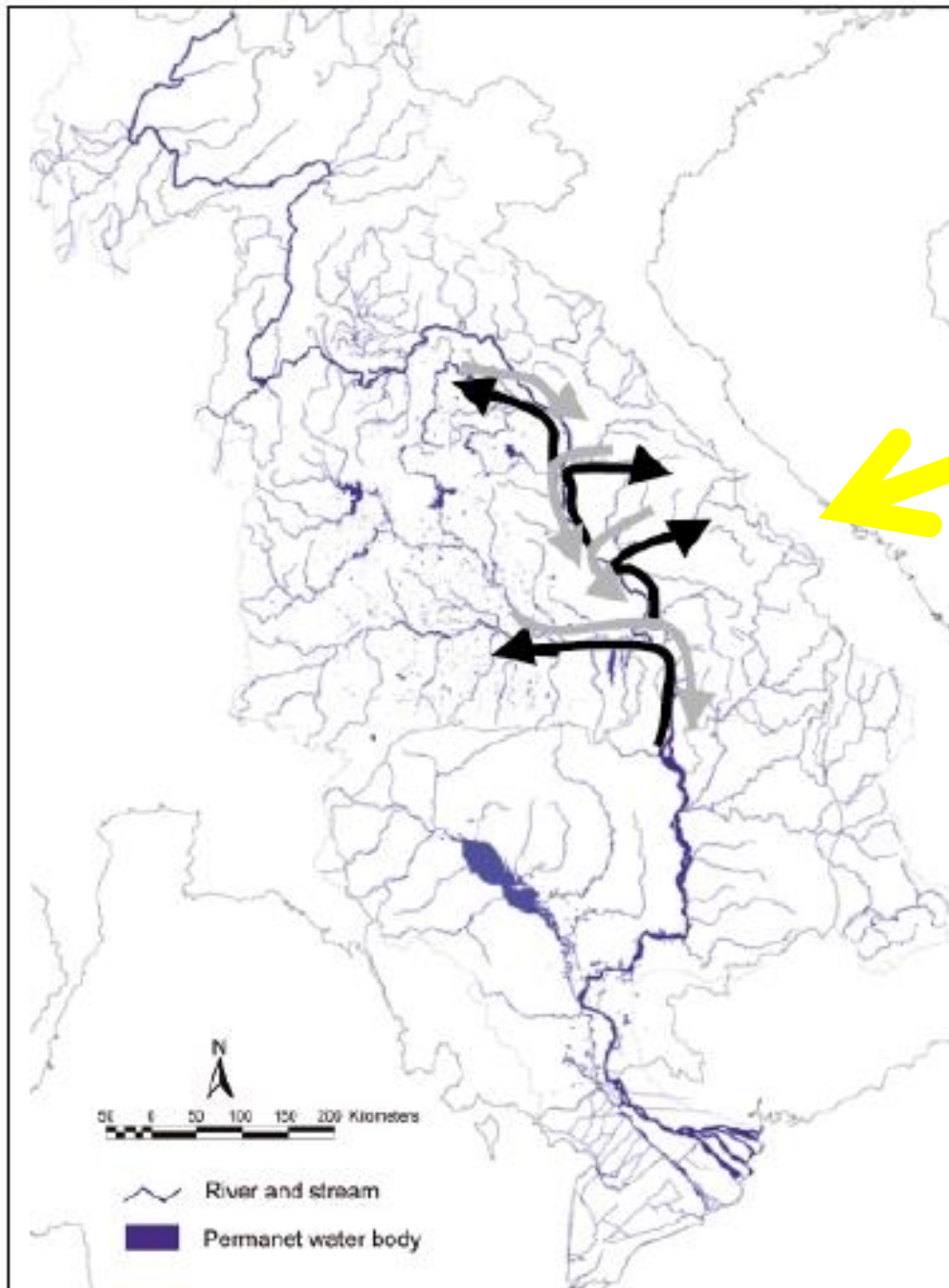
Table: Animal Protein Consumed per Day 2000-2003 (FAO)

An annual economic value of between USD2.1 - 3.8 billion, and between USD4.2 - 7.6 billion at retail prices (ICEM 2010).

Economic Value of the Mekong River Fisheries

- Around 2.1 million tons per year, equivalent to 18% of the global freshwater fish catch.
- Accounts for between 11.7 - 16% or between 8 - 12% of Cambodia's GDP.
- Small-scale fishers are not included in the statistics (ICEM 2010).



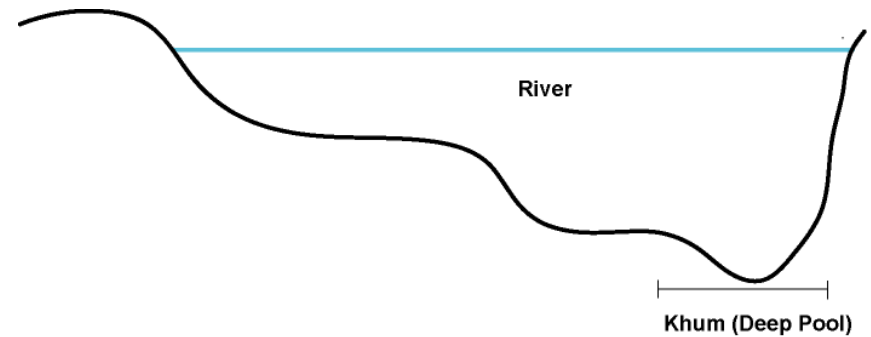
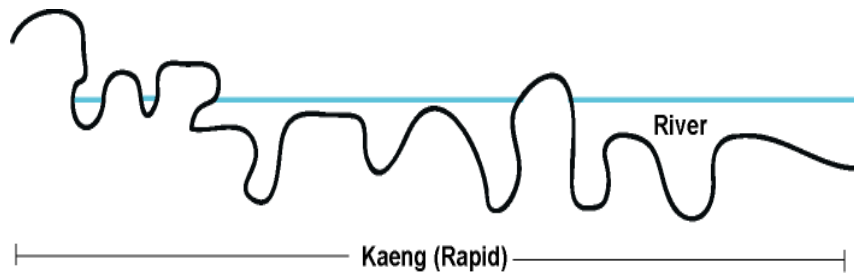


**Fish in the Mekong
basin and their
migration**
Source : MRC

Mun River: Tributary of the Mekong



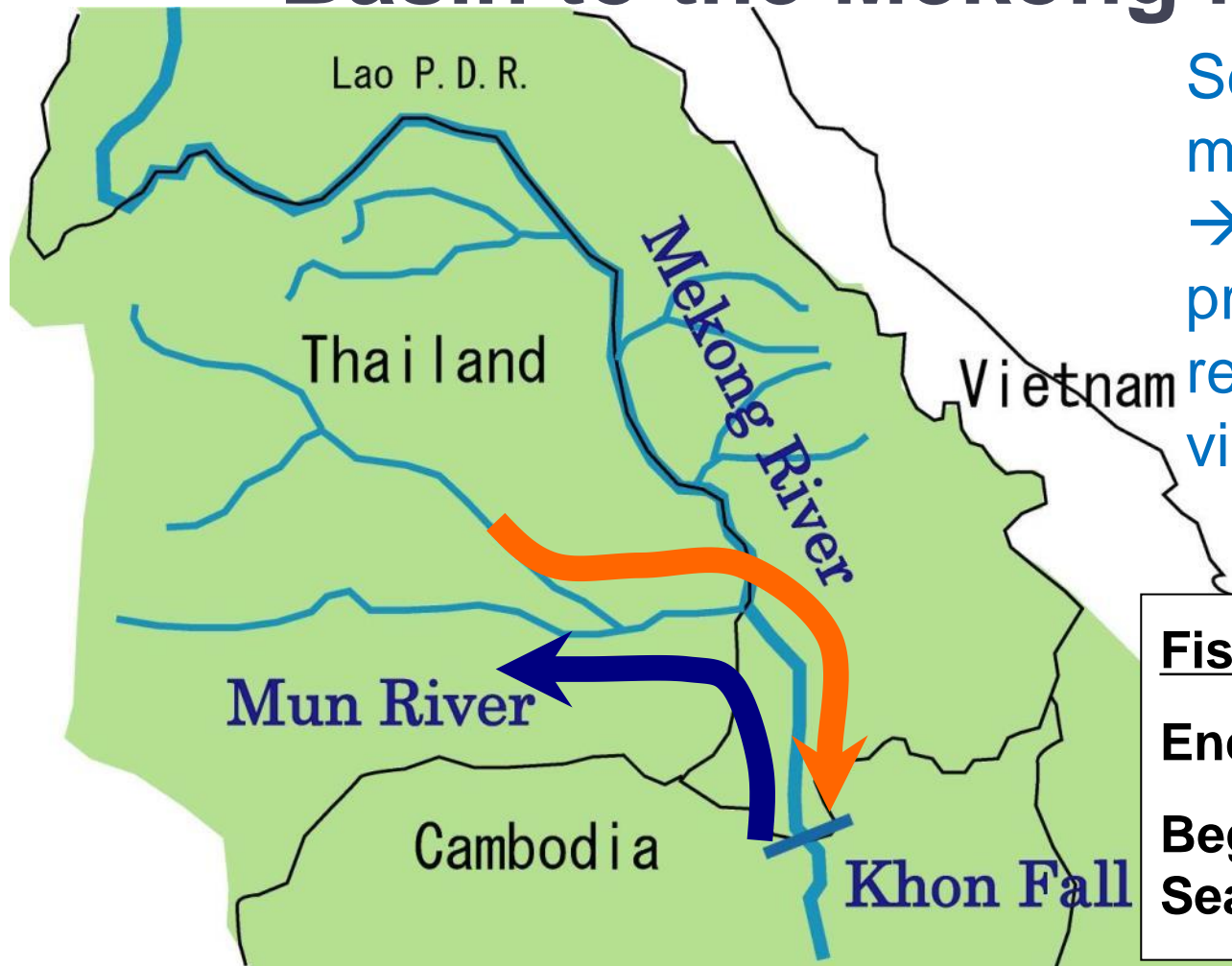
Rapids and Deep pools



Flood forests and oxbow lakes



Fish Migration from the Lower Mun Basin to the Mekong River



Seasonal fish migration occurs.
→ The fishery provided important resources for villagers' lives.

Fish Migration

End of Dry Season



Beginning of Dry Season



Dam Construction on the Mun River

- Pak Mun: Hydropower dam funded by World Bank groups; operation started in 1994.
- Obstruction of fish migration route and destructive fishing activity
- Rasi Salai Dam: Operation started in 1993 changing water flow and ecology of flood forests



Fish Migration

End of Dry Season



Beginning of Dry Season



Lao P. D. R.

Thailand

Vietnam

Rasi Sarai Dam

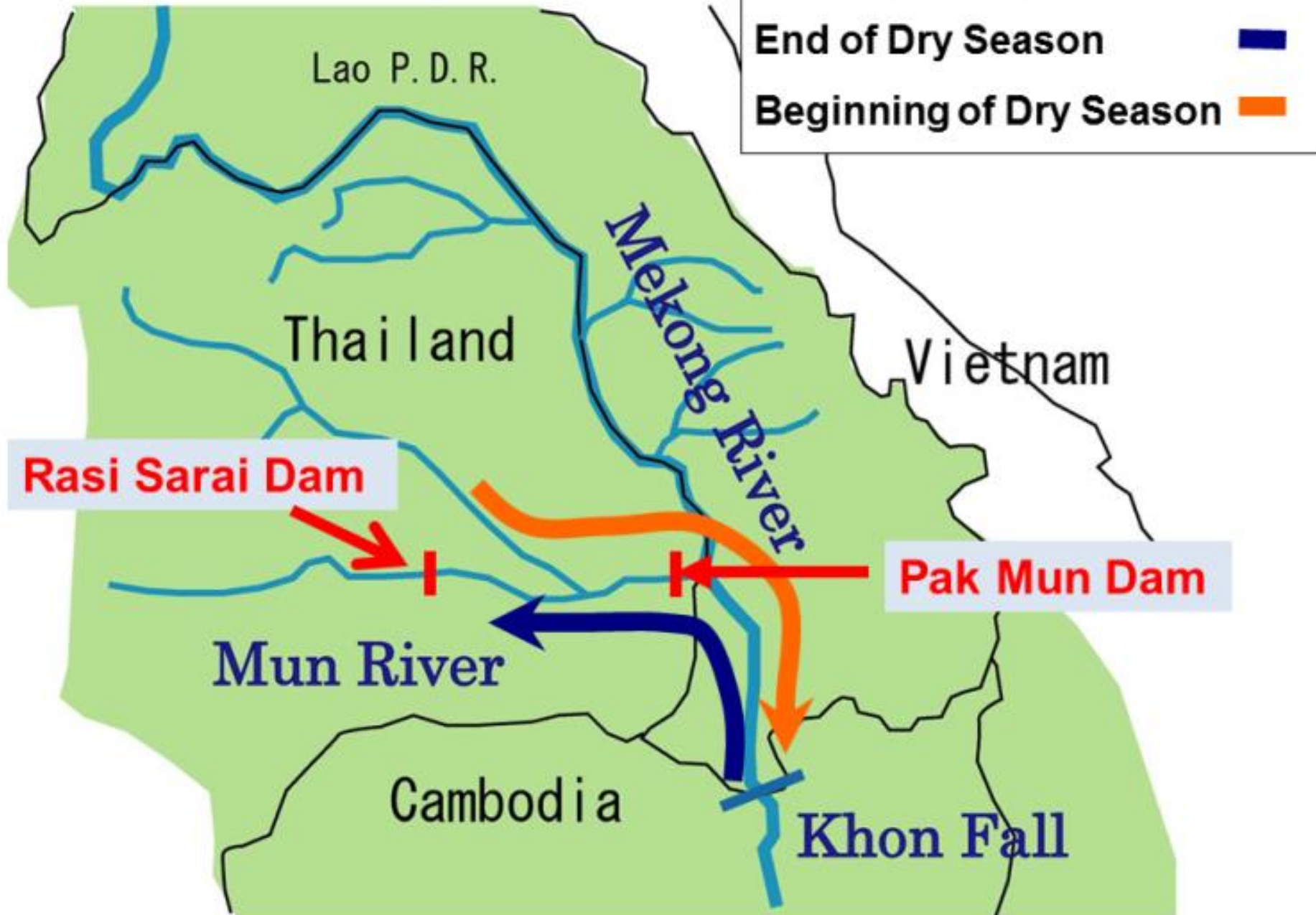
Pak Mun Dam

Mun River

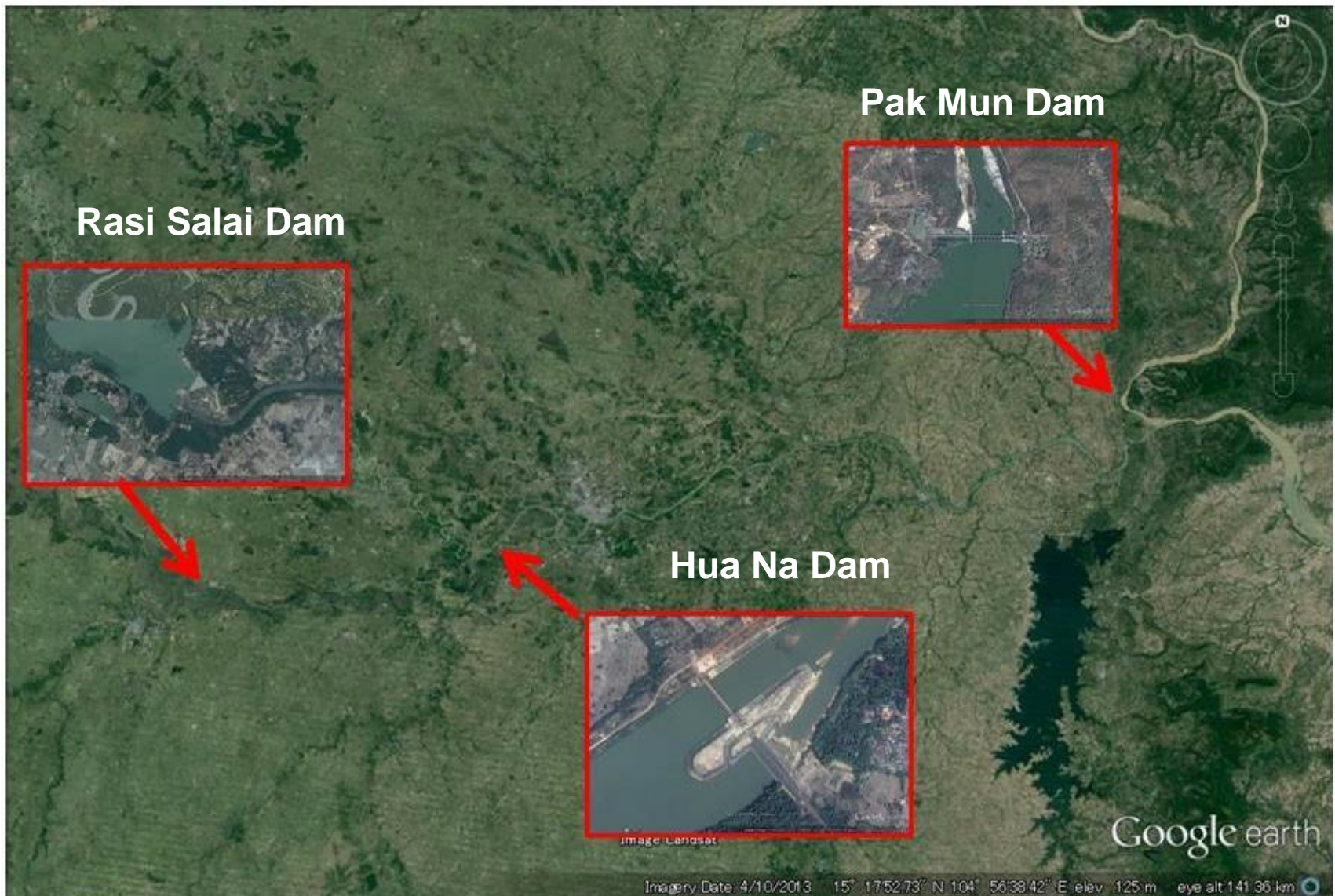
Mekong River

Cambodia

Khon Fall



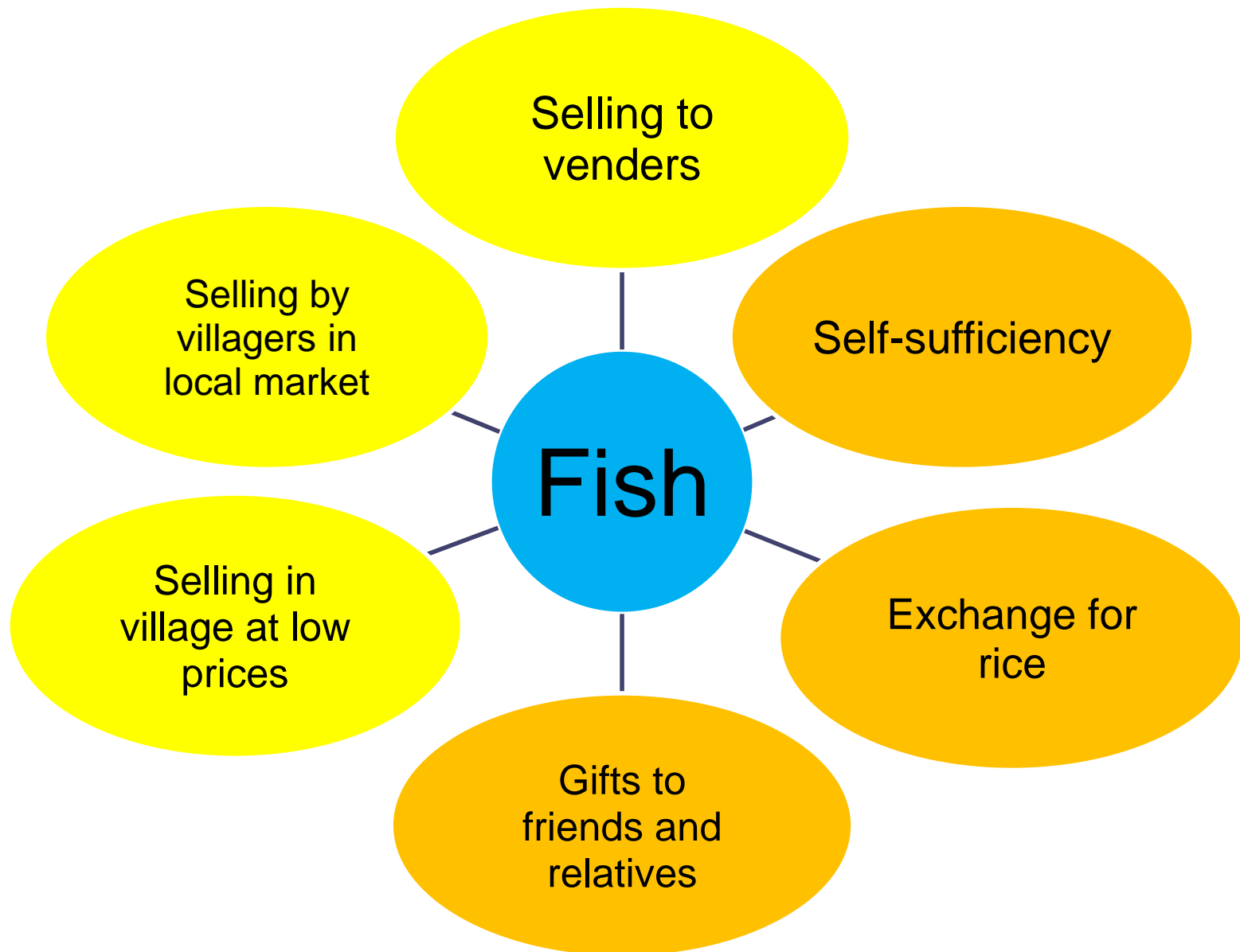
Lower Mun River



People living along the Mun River



Fish in the daily lives of the people



Local People Protest against the Dam



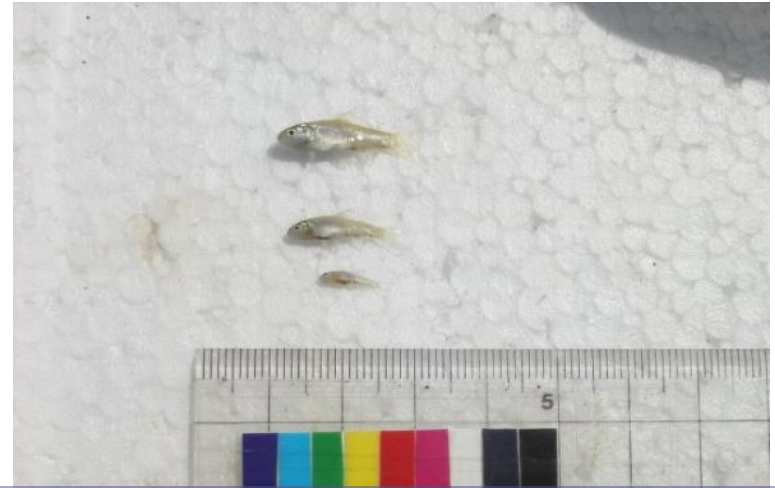
- 1999: People's movement calling for opening of both dam's sluice gates.
- 2001: Thai government announced an experimental opening of the gates.

Income of Villagers per Year (Affected area of Pak Mun Dam)

Year	Income from Fishery (Baht)
Before Dam Construction (1990)	25,742
2000: Gates closed	3,045
2001: Gates opened	10,025

Source: Ubon Ratchathani University (2002)

Research during period with dam gates open



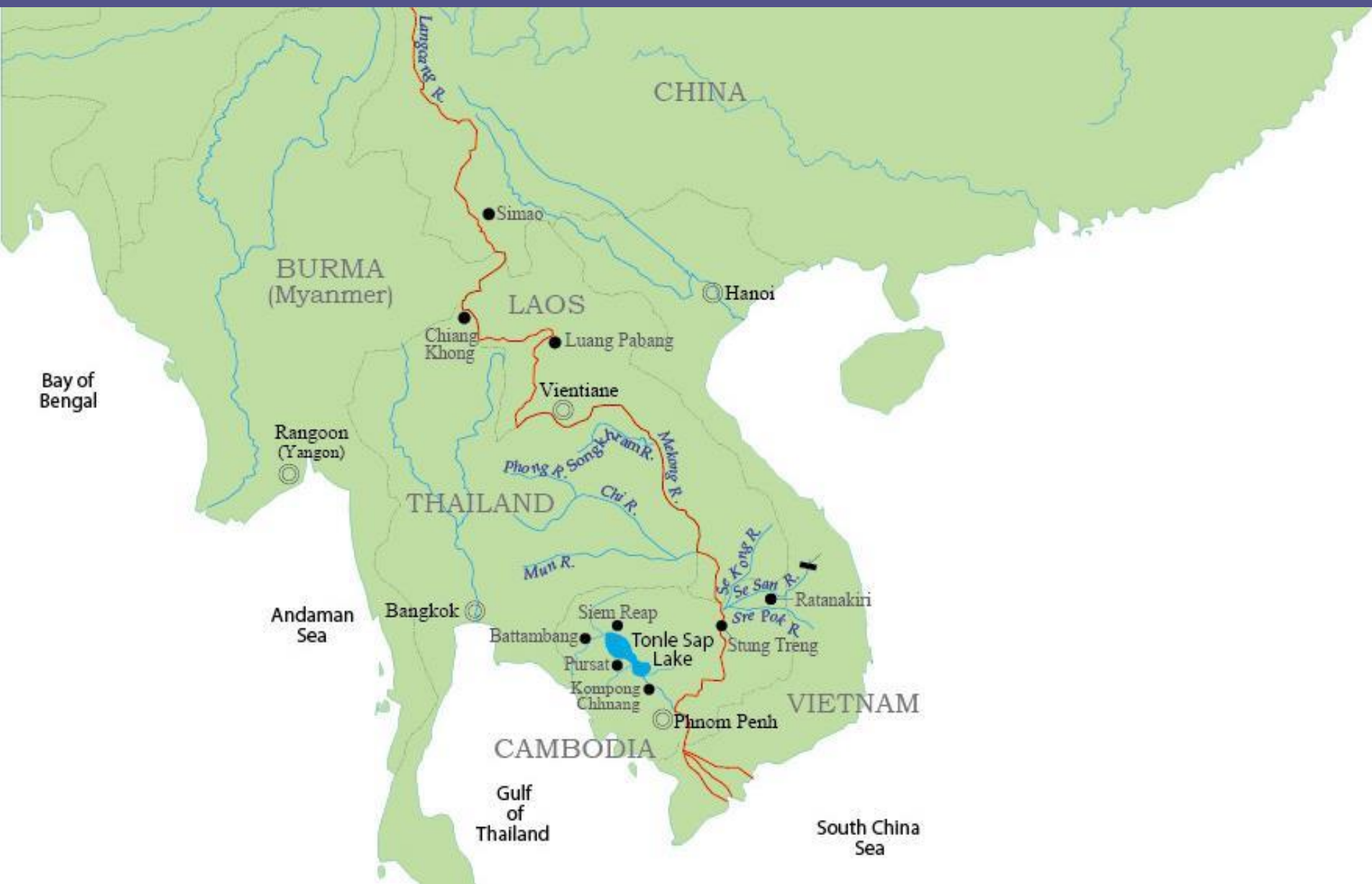
Fish change their habitat in each stage of their life history. Development stages of fish are connected to their habitat.



Research: Knowledge of Freshwater Fish Spawning



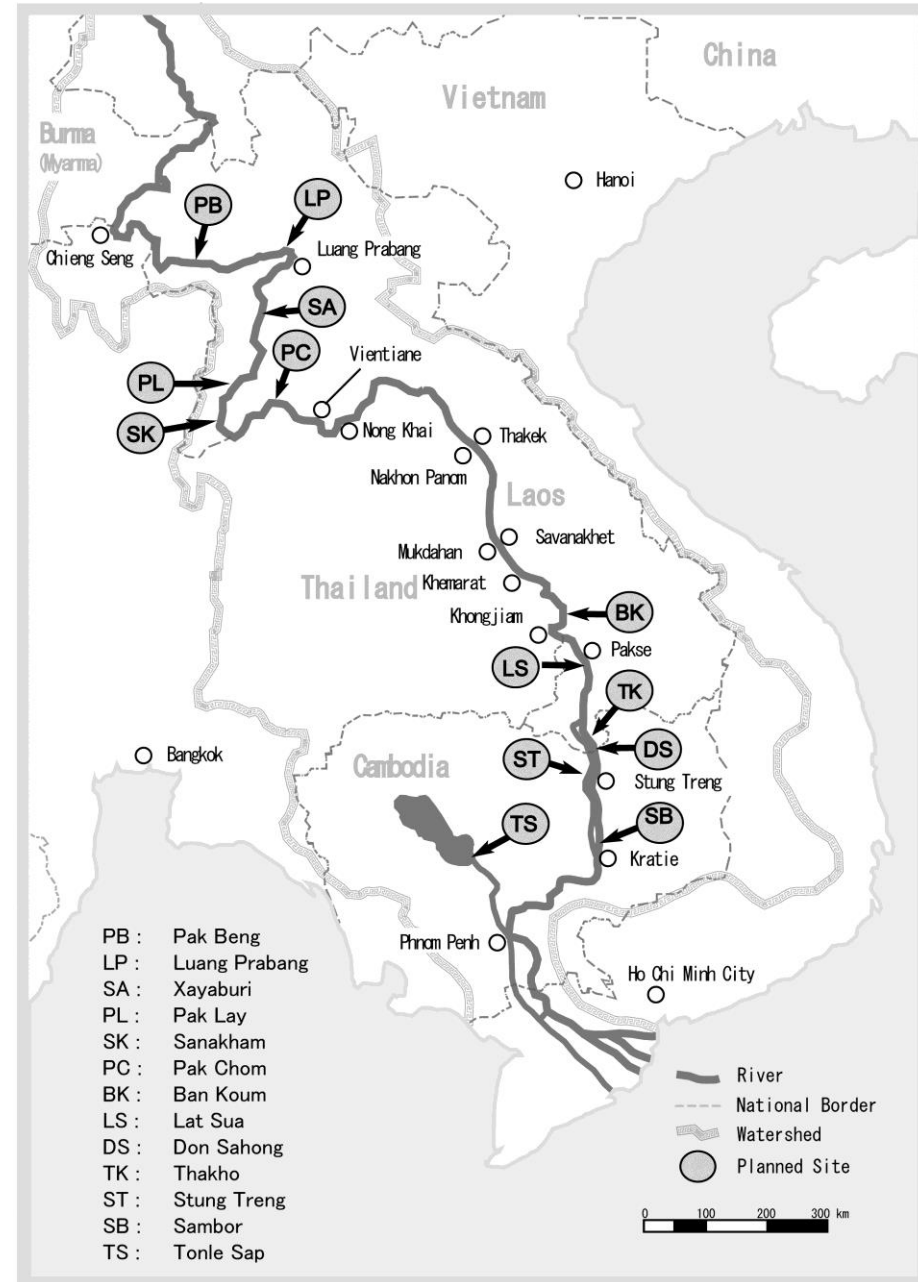
- The fish carry eggs in the rainy season or in the seventh to eighth lunar months.
- It is reported that at a certain time the fish make a sound and swim in pairs when spawning.
- When spawning, the fish enter *hong*, water channels that connect the mainstream of the river with the former river course. The fish make a nest at the spawning grounds, in oxbow lakes, at a depth of 2 to 3m or 7 to 8m.



Dams in the Mekong River

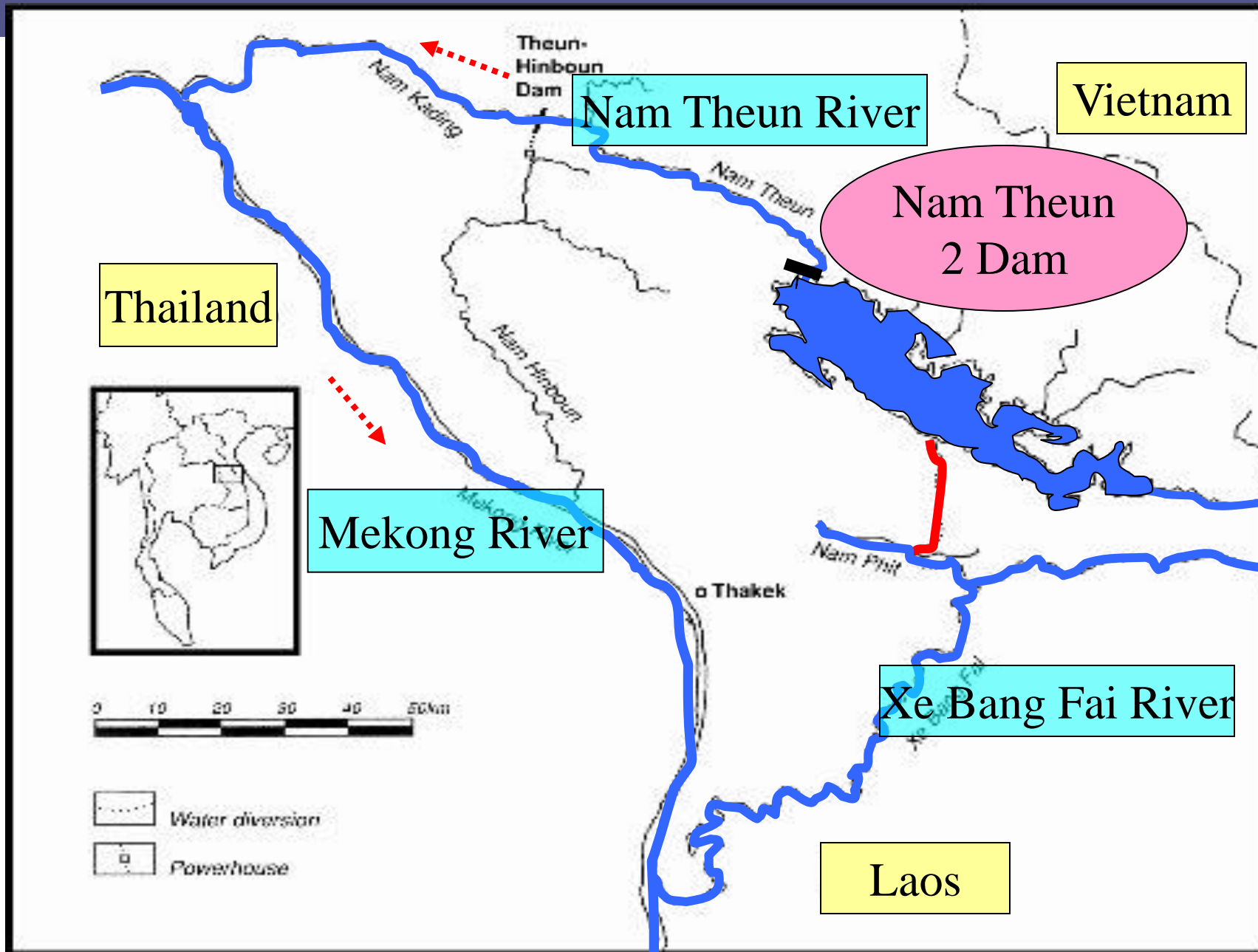


Dams in the mainstream Mekong River



Nam Theun 2 Dam, Laos



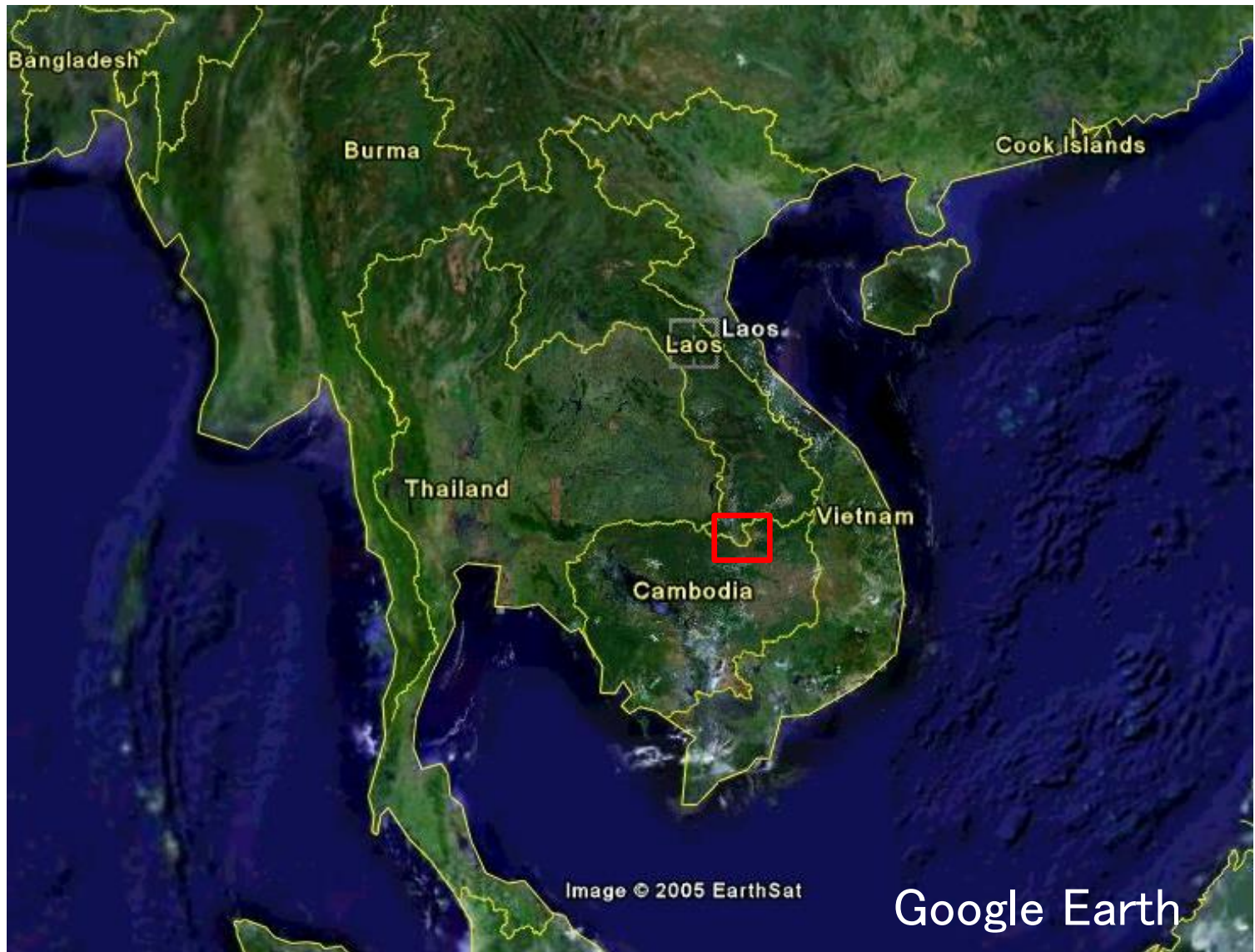


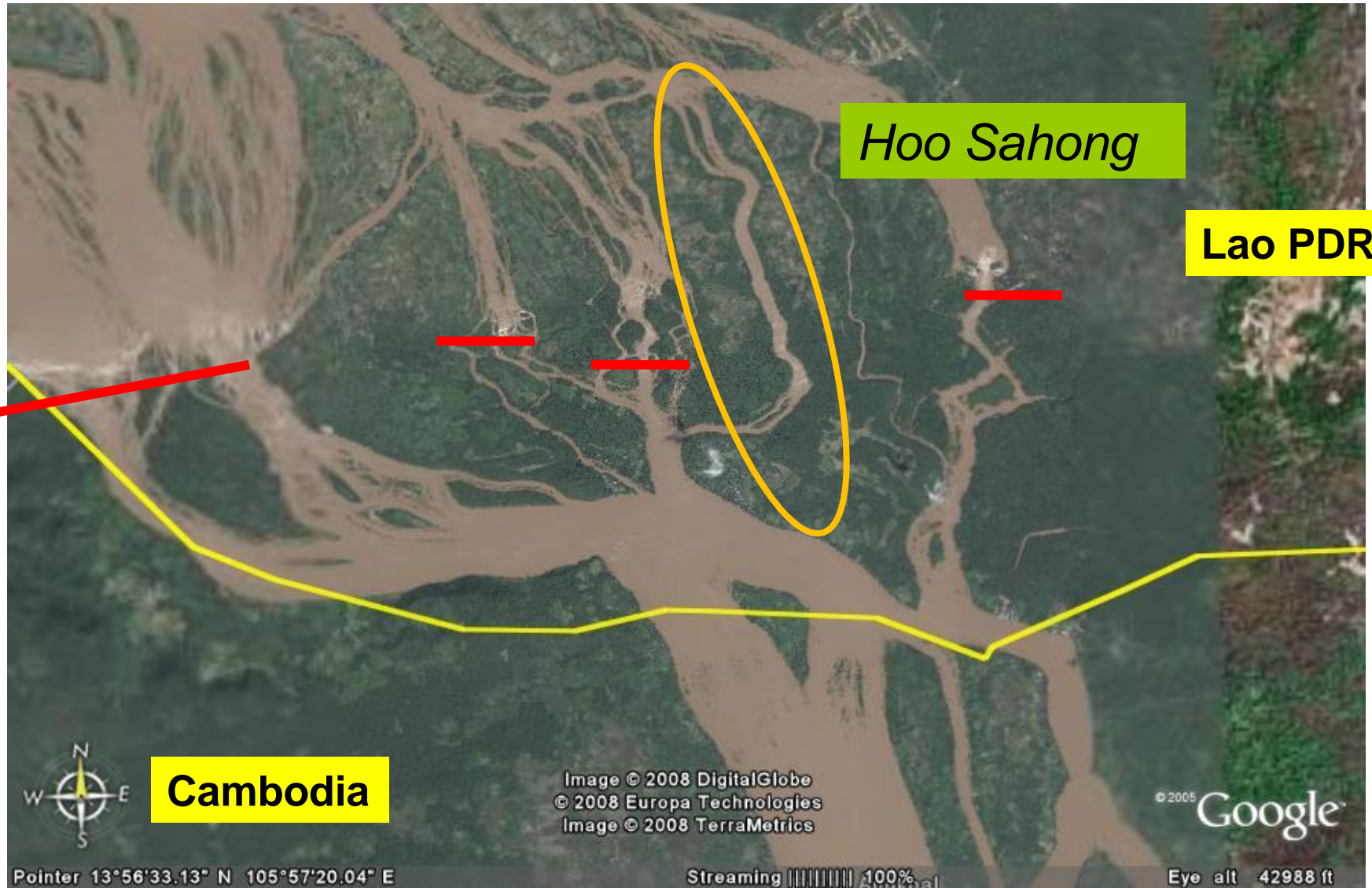
Source: International Rivers Network

Can the fishers fish?

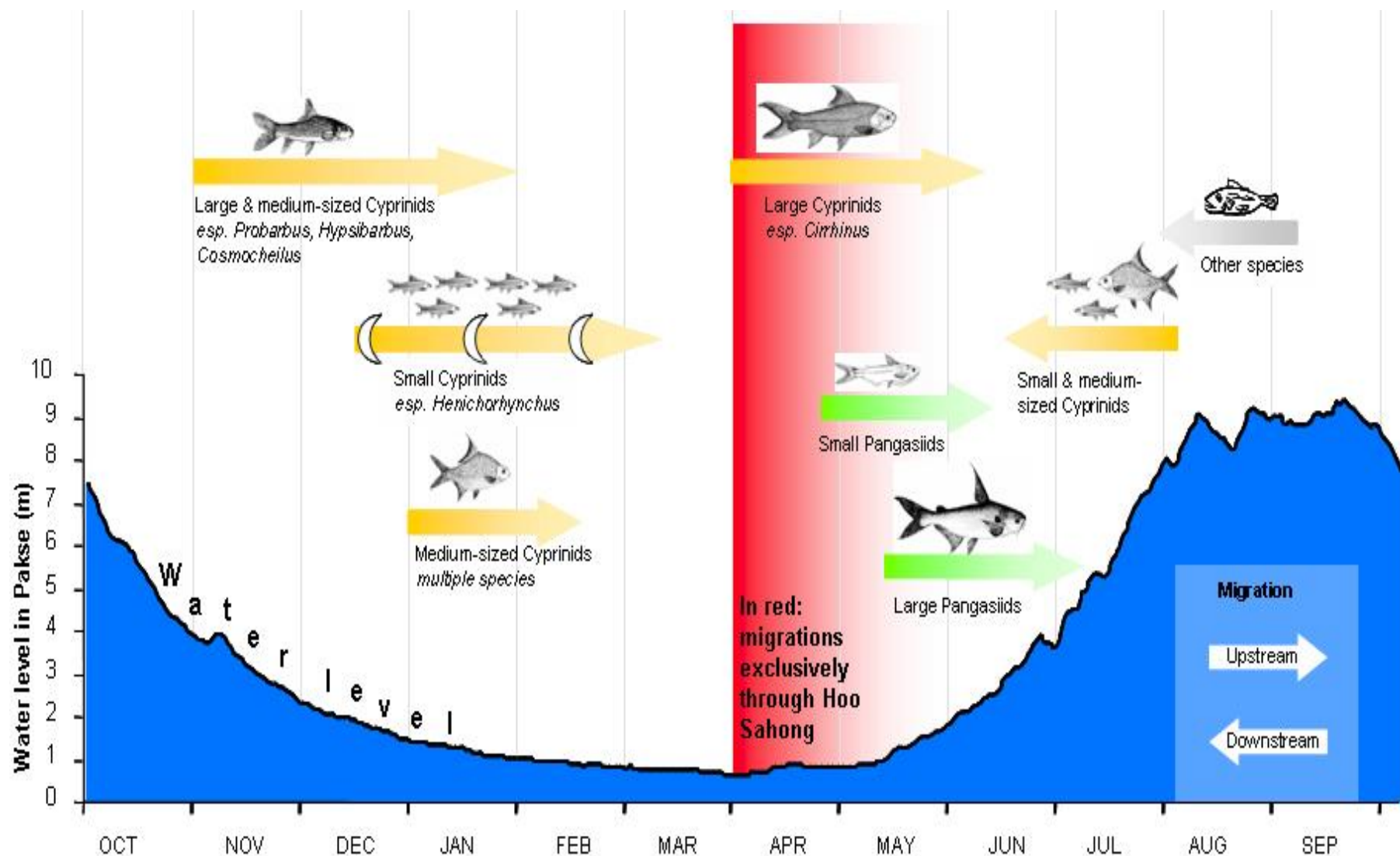


Don Sahong Dam





Fish Migration through Hoo Sahong



Dams in Lao PDR

- 13 Existing Dams
 - 20 Concession Agreements
 - 39 Memoranda of Understanding
 - 23 Project Development Agreements
- (<http://www.poweringprogress.org/new/power-projects>)

Update to: 11-Nov-2015									
Power Project in Lao PDR on Memorandum of Understanding (MOU)									
No	Name	Location	Capacity (MW)	Energy (GWh/yr)	MOU Status	Expiration date	Investor	Market	Status
1	Nam Feung	Vientiane	28	113	14-Aug-13	2-Mar-16	Syntec Construction Public Company	Laos	F/S on-going
2	Pak Lay (Mekong)	Xayabouri & Vientiane	1,320	5,948	11-Jun-07	7-Nov-15	CIEC/SINOHYDRO	Laos-Thai	F/S on-going
3	Luang Prabang (Mekong)	Luangprabang	1,410	7,380	13-Oct-07	16-Sep-17	Pretholviatnam Power Corporation	Laos-Vietnam	PM notice for extend for 24 months
4	Nam Nga	Luangphabang	110	372	11-Apr-12	7-Feb-16	Duang cha leun Co.,	Laos	Expire
5	Xelanong III	Savannakhet	80		2-Oct-13	2-Apr-15	Sinewong Group	Laos	F/S on-going
6	Xelanong 2	Salavan	50	288	11-Jul-12	11-Feb-16	China Gezhouba	Laos	
7	Ban Koun (Mekong)	Champasak	1,872	8,433	25-Aug-08	7-Nov-15	*Italian Thai *Asia Crop Holdings Limited	Laos-Thai	F/S on-going
8	Nam Ngiep (Meung Mai)	Bolikhamxay	38		25-Feb-10	25-Jul-11	Phongsaithany Road & Bridge Construction	Laos	Expired
9	Nam Mouan	Bolikhamxay	124	524	26-May-14	26-Nov-15	Asian & Company	Laos	F/S on-going
10	Xepian-Huayxay	Attapeu	115	283	31-Jan-14	21-Jun-16	DMD	Laos	F/S on-going
11	Nam Pui 1	Xayaboury	60	294	10-Jun-10	13-Feb-15	Soukaseram Trading Co., Ltd.	Laos	Expired
12	Xe Sou	Attapeu	60		9-Oct-11	10-Sep-15	Hong Anh Gai Lai Mineral Joint Stock	Laos	F/S on-going
13	Xekong (Downstream)B	Attapeu	80		28-Nov-11	3-Oct-14	VLS Corporation	Laos-Vietnam	F/S on-going
14	Nam Ngum 4	Xiangkhang	220		26-Mar-14	26-Sep-15	VLV Somphonpaldee Co., Ltd.		F/S on-going
15	Nam Seng	Luangprabang	94		9-Sep-13	21-May-16	China Sichuan Guorong Group Co., Ltd.	Laos	F/S on-going
16	Nam Khan 4	Luangprabang	47		2-Sep-13	3-Feb-15	Donnangsaent road and bridge Construction	Laos	F/S on-going
17	Nam Mouan (Ban Vangden)	Bolikhamxay	60		23-May-14	11-Nov-15	Ponosaek Group		F/S on-going
18	Xekong 5	Xekong	330	1,613	2-May-14	17-Jun-16	Inter RAO-Engineering (Russia)	Laos-Thai	F/S on-going
19	Nam Sum 4	Huaphan	50		19-Sep-12	23-Nov-15	Symon Consulting	Laos	F/S on-going
20	Nam Ngum(Xayaburi)	Xayaburi	70		20-Jun-13	20-Jun-16	Silver Group Company LTD	Laos	F/S on-going
21	Nam Ma 1 2 3	Huaphan	149		10-Jun-14	10-Dec-15	Guangdong Electric Company	China	F/S on-going
22	Xekong 4	Xekong			6-Nov-15	6-May-17	Laos-World Group		F/S on-going
23	Hoiy paly	Champasak	26		16-Dec-14	16-Jun-16	Guangdong Electric Company	Laos	F/S on-going
24	Xekong 3A&3B	Attapeu	205		31-Mar-15	31-Sep-16	Asia Investment & Development Co., Ltd.		
25	Nam Mang (Upstream)	Xaysomboun	50		27-May-15	27-Nov-16	Venture Capital and Equity Investment, Inc	Laos	F/S on-going
26	Wind Power (Savannakhet)	Savannakhet	No Information		21-May-15	21-Nov-16	Asia Investment & Development Co., Ltd.	Laos	F/S on-going
27	Wind Power (Attapeu)	Attapeu	No Information		21-May-15	21-Nov-16	Asia Investment & Development Co., Ltd.	Laos	F/S on-going
28	Wind Power (Salavan)	Salavan	No Information		21-May-15	21-Nov-16	Asia Investment & Development Co., Ltd.	Laos	F/S on-going
29	Wine Power (Bolikhamxay)	Bolikhamxay	No Information		30-Jan-15	30-Jul-16	Phongsaphany Co., Ltd.	Laos	F/S on-going
30	Wine Power (Khammouan)	Khammouan	No Information		30-Jan-15	30-Jul-16	Phongsaphany Co., Ltd.	Laos	F/S on-going
31	XelPon 3	Salavan	47 MW		21-May-15	21-Nov-16	Korea Water Resources Corporation	Laos	F/S on-going
32	Solar Power	Vientiane Capital	60		9-Jun-15	9-Dec-16	Pacific Star Capital Management, Inc	Laos	F/S on-going
33	Hoiy La-nge	Xekong	50		21-Jul-15	21-Jun-17	Janion International Investment Limited	Laos	F/S on-going
34	Nam Tha 2	Luangprabang	41		9-Jul-15	9-Jun-17	Intra Corporation Solds Co., LTD	Laos	F/S on-going
35	Caoi Power (Meungphim)	Savannakhet	300		9-Oct-15	9-Apr-17	BIP Agricultural Co., Ltd.	Laos	F/S on-going
36	Caoi Power (Bolikhamxay)	Bolikhamxay	No Information		1-Jul-15	1-Jan-17	Phongsaphany Co., Ltd.		F/S on-going
37	Caoi Power (Khammouan)	Khammouan	No Information		1-Jul-15	1-Jan-17	Phongsaphany Co., Ltd.	Laos	F/S on-going
38	Pak ngum	Vientiane Capital	84		1-Sep-15	1-Mar-17	Vientiane Automation and Solution Engineering Co., Ltd.	Laos	F/S on-going
39	Nam Cha 2	Xaysomboun	50		4-Sep-15	4-Mar-17	Nantha Construction Road-Bridge	Laos	F/S on-going
Total			7,233						

Lower Sesan 2 dam (LS2)



LS2 is under construction on the Sesan River in Sesan District, Stung Treng Province.

- LS2 could reduce the basin's sediment load by 6.0 to 8.0%
- At least 78,000 villagers living upstream of LS2 will lose access to migratory fish
- LS2 will cause a 9.3% drop in fish stocks basin-wide

Our Recommendations

- Mainstream dams should be suspended.
- Research on the cumulative impacts of dams in the Mekong River Basin is a crucial requirement that should be carried out before new projects start.
- Mainstream and tributaries should be protected as one ecosystem for sustainable resource management.
- We must learn from the experiences of the dams on the Mun River.
- We need to seriously reconsider the development of the Mekong and its tributaries.



Thank you.