

Study Region

Mekong River runs through Indo-China peninsula. It originates Tibetan Highlands and goes through China, Myanmar, Laos, Thailand, Cambodia and Vietnam before reaching South China Sea. In this study, the focused areas are the river banks in Laos, Thailand, Cambodia and Vietnam, and we studied from Northern areas where Laos, Thailand and Myanmar meet their borders, to Southern areas like Tonle Sap in Cambodia and river mouth in Soc Trang province in Vietnam (see Table 1 and Figure 1).

Laos has large areas of its land in the riverbank of Mekong with the exception of northern most area. The river makes borders between Thailand and Myanmar. In Thailand, the river basin includes northern Chiang Rai and areas north up to border in addition to northeast regions. Most of the land in Cambodia is in Mekong River basin. The main stream runs through the country north to south, and it meets Tonle Sap River at Phnom Penh. After Phnom Penh, the river diverges into main Mekong stream and Basak River towards Vietnam. They form great delta centering on South Vietnam city of Can Tho flowing into South China Sea.

Table 1 List of major cities which *Mizube no Sachi* study was conducted (No. corresponds numbers in Figure 1).

No.	Country	Province	Citiy, village
1	Laos	Bokeo	Houayxay
2		Bokeo	Na Luang vill.
3		Louang Phrabang	Louang Phrabang
4		Sainyabuli	Sainyabuli
5		Vientiane province	Vang Vieng
6		Vientiane capital, Vientiane province	Vientiane
7		Bolikhamxai	Paksan
8		Bolikhamxai	Lak Sao
9		Khammouane	Thakhek
10		Savannakhet	Savannakhet
11		Salavan	Salavan
12		Champasak	Pakse
13		Sekong	Sekong
14		Attapeu	Attapeu
15	Thailand	Chiang Rai	Chiang Rai
16		Khon Kaen	Khon Kaen
17		Ubon Ratchathani	Ubon Ratchathani
18	Cambodia	Ratanakiri	Banlung
19		Stung Treng	Stung Treng
20		Kratie	Kratie
21		Kampong Cham	Kampong Cham
22		Siem Reap	Siem Reap
23		Kampong Chhnang	Kampong Chhnang
24		Phnom Penh	Phnom Penh
25		Prey Veng	Prey Veng
26		Takeo	Takeo
27		Battambang	Battambang
28		Pursat	Pursat
29	Vietnam	Can Tho government-ruled municipality	Can Tho
30		An Giang	Chau Doc
31		Soc Trang	Soc Trang
32		Soc Trang	Cu Lao Dung

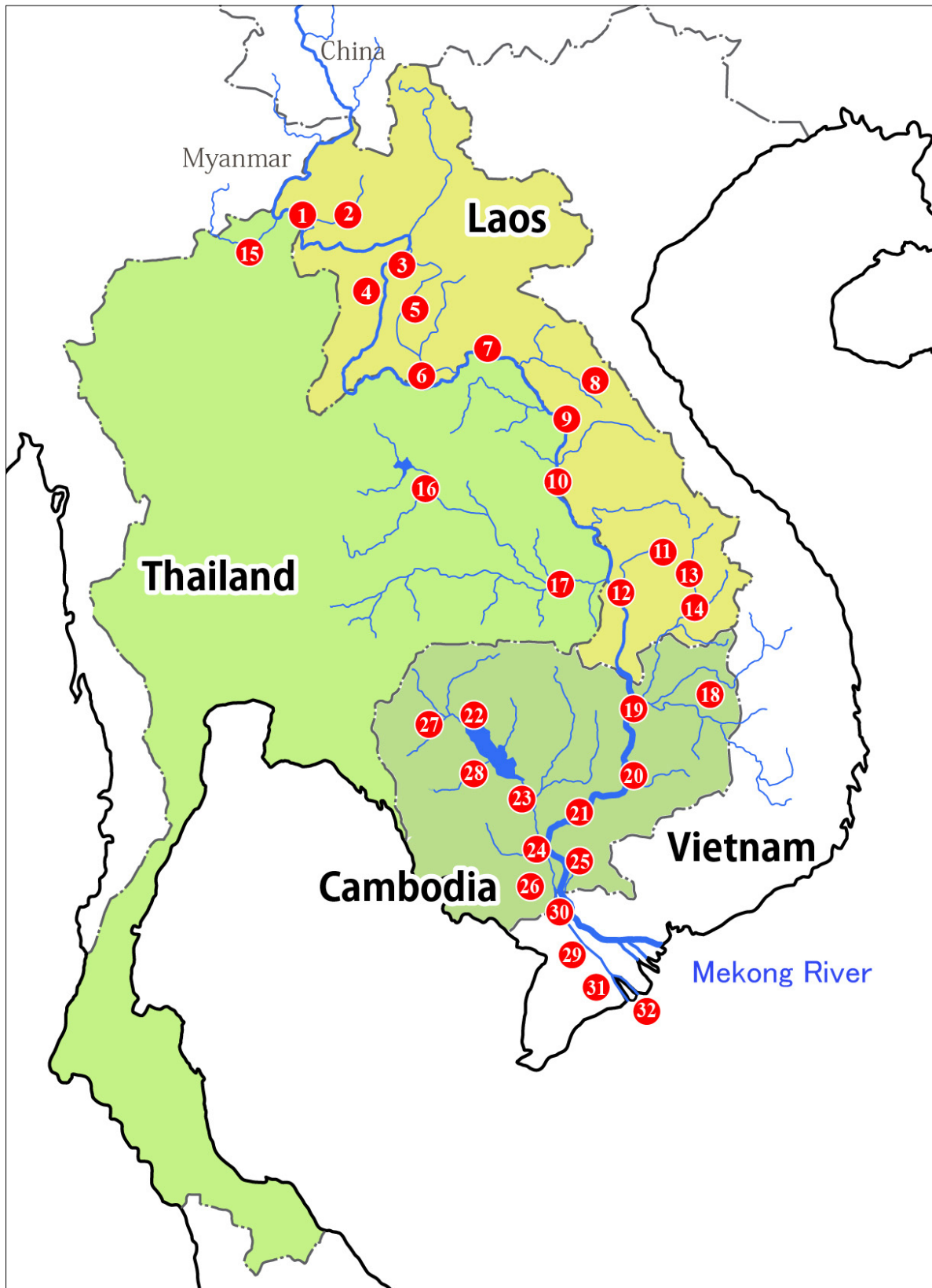


Figure 1. Map of major cities the study was conducted

Seasons

Majority of areas in Mekong river basin belong to tropics. Southwest wind in summer and northeast wind in winter take over the region. Because of this monsoon effect, the peninsula has distinct dry and wet seasons. Onset of each seasons vary from region to region, but in most areas, wet season starts from late April to mid-May, and lasts until late October to early November. Depending on precipitation, water level of Mekong River changes between the two seasons. In Tonle Sap Lake in Cambodia, the water flows out to Tonle Sap River then into Mekong River during dry season, but as the water level rises in Mekong during wet season, water flows backwards into Tonle Sap Lake. During the heaviest precipitation period, area of the lake expands more than five times than that of dry season. Water depth also increases to four to ten times more than any season. In Laos, the study team was told the seasonal difference of Mekong's water level becomes 15m in Louang Phrabang, 10m in Vientiane, and 12m in Pakse.

Distinctive seasonal changes have large impact on the ecosystem of organisms in the region. Termites start to fly and *Lethocerus* begin to lay eggs as soon as the first rain of wet season falls. As the water rises, wet areas expand and enable some fish to swim into paddies and wetlands to lay eggs. During dry season, when the paddies are dry, aquatic lives migrate to wetter condition. In paddies when it's dry, one can see some fish which could not escape in time in paddles or see pond snail burying itself in mud in order for them to keep remaining moisture. There might be a few tens of diving beetle, huddling in the last oasis of paddles. People along Mekong are well adapted to the seasonal changes and pay close attention to it. People in farmland are especially aware of which *Mizube no Sachi* is in season. Rain sometimes brings flood damages, but at the same time, it is a blessing from nature so that organisms and people can sustain lives and culture in the area. Seasonal change nourishes *Mizube no Sachi*. At one time, the study team came across an area where roads and houses had been flooded by water rise during wet season. There seemed to be no residents who were disturbed by the fact and they simply went to get their fishing poles and nets and began fishing in flooded road. It seemed that average yearly overflow of river is more or less expected event as a part of life and people try to take advantage of it. This cultural value of "going with the flow" gave us basic insight when researching *Mizube no Sachi*.



People fishing in flooded road side 10 Sep. 2007 Vientiane Capital, Laos

Local Markets

Due to intense sun shine and high temperature, Market sellers in Mekong river basin develop various methods to keep their produce fresh. It is essential to start markets early in the morning when the sun and temperature are still low. Some markets have both or either morning and evening market depending on the locations, but most of fresh caught fish and plant produce are being sold in the morning. As the sun gradually increases its intensity, the sellers put over shade and splash water on the produce and ground to keep them from wilting. It is best to sell them all as early as possible for the benefit of both sellers and customers who are looking for fresh produce. Some stores are open into afternoon, but there are hardly any fresh produce and if any, most plants have been wilted so one would hardly see a customer.

[Preserving food]

Generally, local markets in inland Mekong river basin are not equipped with ample refrigeration facility. Therefore, small aquatic lives such as fish, frogs, and crabs are brought alive and sold. Although it is not *Mizube no Sachi*, live saltwater Bloody clam *Tegillarca granosa*, can be seen in inland markets, because people know it can sustain life longer because of hemoglobin presence in it.

Dead animals should be sold immediately, or if they are harvested regularly, they are dried or smoked. The team observed dried fish related to snakehead and drum, and they tasted very salty. Some frogs are dried on skewers. One other method to preserve fresh produce is fermentation. Traditionally there are many fermented food, using fish, small shrimps, legumes, and grains in Mekong river basin, but we were not able to do detailed research in this study. Given the importance status as *Mizube no Sachi*, we believe the fermented food can be another category itself when studying about *Mizube no Sachi*. We leave it as a future project. Following section describes general fermented and dried food.

[Seasonal, Local, Taste preferences]

Items found in market have seasonal variety. Because there is distinct dry and wet periods, animals or plant buds, fruits and flowers differ according to the seasons. For example, honey from giant honeybee (*Apis dorsata*) and sugar from sugar palm (*Borassus flabellifer*) can only be found in dry season.

There are also geographic variety. Yanan (*Tiliacora triandra*) is a popular plant used in Thailand and Laos when boiling bamboo shoots. But it is not seen as soon as you cross the border to Cambodia, and instead, Cambodians use a plant called Ngop (*Sauropus androgynus*) for the same purpose. In Laos, insects are popular food source and one sees large variety and amount of insects being sold. But in Cambodia, majority of people say they do not eat insects. It is true that cicada and stinkbug are not sold in Cambodian market, but cricket, giant water bug, predaceous diving beetle are still popular, and even winged termites are eaten as annual seasonal prized food. Weaver ant is an essential part of making Cambodian soup. Overall, there are country and regional difference in terms of levels of assimilation, but we can say that using insect as food is a shared culture along Mekong river shed.

Furthermore, not all people eat all the food you see on the market. We heard different opinions on taste preference of larva of horned dung beetle, and large snails, or stalk of very bitter yam plant. When a large live jewel beetle was on a market, some people purchase it as food while others do so as a toy for children.

[Mammals and Birds]

Wild bird and mammals are commonly seen in many markets in mountain areas. Trading some animals is illegal. Therefore, sellers tend to hide them from the sight of foreigners like us, or they don't allow any pictures to be taken. We wanted to maintain friendly relationship with locals, so we have excluded those animals from research target. Moreover, it was not clear if they can be included within category of *Mizube no Sachi*, the only applicable definition of which, can be "caught easily with minimum time spent."



27 May 2009 Tha Heua Market, Louang Phrabang, Laos



24 Nov. 2009 Vang Vieng Market, Vientiane Province, Laos

Traditional Cooking

<Fish sauce>

Fish sauce is a fermented food which is made by salting fish and other shellfish, then leaving them for a while to let the enzyme work on the process of fermentation. It is used in daily life in Mekong river basin and so it is one of most essential seasoning when talking about food culture in this area. In inland Mekong river shed, freshwater fish is abundant and it is used for making fish sauce. They are called *Nam pa* in Laos and NE Thailand, or *Nam pla* in other parts of Thailand, *Tuk Trey* in Cambodia. Many of them are in a glass jar and manufactured in factories. Fish sauce is used to season soups, noodles and other dishes. It is usually set on tables of eateries.

While fish sauce is widely available commercially, there is homemade seasoning called *Pa daek* (NE Thai and Laos), *Pla ra* (Central Thai), *Pa ha* (Northern Thai), *Pra hoc* (Cambodia). These are paste fish sauce, and are very versatile. Not only is it used as seasoning, it can be served as a side either as it is or mixed with herbs or used in main ingredients of main dishes. This homemade fish sauce is usually made from freshwater fish, and quite often the entire process of making the sauce (catching fish to final sauce) takes place at home. The broth, byproduct of making the paste is called *Nam pa daek* (in Laos, NE Thai), *Nam pla ra* (central Thai), *Nam pa ha* (Northern Thai), *Tuk Trey* (Cambodia), and is also used as seasoning.

People who make homemade fish sauce are not very many in urban areas of Thailand, but it is still commonly made in NE Thai, Laos and Cambodia as an essential seasoning. There are many other kinds of fish sauce using saltwater fish, shrimps, and crabs.



Fish paste (Pa daek)



Making home made fish sauce

<Fermented Sushi>

Fermented Sushi is a fermented food either commercially or homemade. Most of the time, it is made by lactic fermentation of salted freshwater fish and steamed sweet rice. Often times, it is made by whole or cut fish which is scaled and cleaned while others use minced fish, fish mixed with organs, or fish eggs. Family Cyprinidae of and order of Catfish are often used as main ingredients and other kinds like Family Osphronemidae or Channidae are used. There is another type of fermented food commonly known as *Som pa* (Lao, NE Thai), *Pa som* (NETHai), *Pla som* (Thailand), *Pa mam* (Thailand), *Pa chao* (NE Thai, Northern Thai), *Phaak* (Cambodia). *Som* means sour in Lao and Thai, and *Pa* or *Pla* means fish. It literally tastes like what it says. It can be eaten raw but as a sanitary precaution, people often heat it up to serve.



Many kinds of fermented Sushi sold in markets



Fermented Sushi of fish eggs

<Dried, Smoked food>

Large catch of fish and frogs are often dried and smoked to enable longer storage. The fishes of family Cyprinidae and order Siluriformes are commonly used as well as other large and small fish. As for frogs, *Hoplobatrachus rugulosus* and *Fejervarya limnocharis* are most commonly used. Smoked and dried goods are served after heating, stir-frying, or frying.



variety of smoked fish



Smoked frogs

<Cheo (*Nam prik*)>

A type of paste made by sautéing and mixing main ingredients, chili, green onion, shallots, and herbs, seasoned with fish sauce, salt, or MSG. It is called *cheo* in NE Thai and Laos, *Nam prik* in other parts of Thailand with variety of ingredients. Main ingredients can be giant water bug, stink bug, cricket, mole cricket, frogs, fish, and mushrooms. The simpler form of *cheo* which can be made by fish sauce and chili. This is more liquid and since it is easier to make, it is widely incorporated into home cooking. *Cheo* is often eaten by dipping steamed sweet rice as well as raw vegetables cooked fish and meat, or put in soup and noodles. It is essential in home cooking in Laos and Thailand.



Cheo of stink bug



Cheo is often eaten as a dip for sweet rice

<Lap, Koi>

These are local favorites in Laos, NE Thai, and Northern Thai. It is a kind of salad with minced meat or fish mixed with herbs, rice flour, chili, dried onion, and seasoning. Seasoned with fish sauce, salt or lime. Knifefish's lap is the most famous among freshwater fish lap. Lap and Koi are very similar.



Koi of weaver ant



Koi of Nile tilapia

<Mok>

Lao cuisine of aquatic animals, steamed in banana leaf. Main ingredient is seasoned with herbs, chili, salt and fish sauce. Small aquatic animals such as small fish, aquatic insects, tadpoles are often cooked this way.



ingredients are wrapped in banana leaf



Mok with small fish, frogs, aquatic insects and shrimp

