동남아시아연구 30권 2호(2020) : 409～452

The Perceived Impacts of Upstream Dam Building in the Mekong River on Downstream Communities in Thailand: The Case of Chiang Rai Province

Silsupa Wiwatwicha* · Edo Andriesse**

Abstract

This paper investigates the perceived impacts of upstream river activities upon the livelihoods and community of riverbank villagers in downstream waters. The case study focuses on communities in three districts of Chiang Rai Province, Northern Thailand. The Province borders Laos and Myanmar and is the most upstream Thai province along the Mekong River. While many studies have focused on the socio-ecological and socio-economic effects, we also emphasize socio-cultural aspects, based on a reading of mostly Thai language sources. These aspects are often intangible, yet no less important for the overall well-being of river bank communities with rich and long standing traditions. However, the perceived threats to such intangible, yet vital, elements to the community's ecology have reinvigorated activism of local civil society, and hence, could be seen as a positive to social cohesion. Combining the insights from the perceived livelihoods and community impacts generates an interesting

* Graduate School of International Studies, Seoul National University, MA Student, silsupaw@snu.ac.kr

** Department of Geography, Associate Professor, Seoul National University (corresponding author), edoandriesse@snu.ac.kr

paradox: The changing Mekong ecology leads to an erosion of local cohesion in the economic sphere, but to a strengthening and empowerment in resistance against government decisions and policies. These results reflect problems in policy-making processes with respect to (1) failures to engage with the local population; (2) a strong focus on economic gains at the macro-level; and (3) weak communication with local communities regarding forthcoming ecological changes. The paper concludes by providing suggestions for further research.

Key Words: Chiang Rai, Mekong Dams, river bank livelihoods, intangible effects, civil society

Ⅰ. Introduction

Considering the relations between China and mainland Southeast Asian countries, the Mekong River is increasingly becoming a complex transnational corridor; one of the most dynamic political-economic spaces in Southeast Asia (Wong 2018). Despite its accommodating efforts through the Lacang-Mekong Cooperation (LMC) mechanism, China is perceived by various stakeholders as a threat against the sustainability of river resources (Liebman 2005). Above all, China's dam constructions and its navigation channel improvement projects impose high environmental costs to all members who share the Mekong River, and socio-economic costs to the local communities living on the river banks. So far, China has completed eleven hydropower stations, and has planned to construct six more (Appendix 1). Furthermore, to allow 500-tonne cargo ships pass through the river, China has destroyed rapids and dynamited

shallows in the upper river, and plans to continue on the lower stream <Table1>. This reflects its intention to expand trade from China's Yunnan province through Thailand and Laos which is a part of the Belt and Road Initiative (Sanford 2018). Such upstream activities have dramatic effects for the Mekong water basin with respect to fisheries, hydrology, and sedimentation flows (Lu et al. 2006; Kummu & Varis 2007; Baran & Myschowoda 2009; Foreign Policy 2020). Such ecological alternations undoubtedly affect people who depend on the river for their livelihoods.

Against this backdrop, this paper investigates the *perceived* impacts of upstream river activities upon the livelihoods and community of riverbank villagers in downstream waters.[1] The case study focuses on communities in three districts of Chiang Rai Province, Northern Thailand. The significance of this geographical area is that among all Mekong river bank communities in Thailand, villages are most immediately exposed to the impact from upstream river activities. The Province borders Laos and Myanmar and is the most upstream Thai province along the Mekong River. While many studies have focused on the socio-ecological (water flow, quality, sediment flux) and socio-economic effects (impacts on fish catch and agriculture), we also emphasize socio-cultural aspects, based on a reading of mostly Thai language sources. These aspects are often intangible, yet no less important for the overall well-being of river bank communities with rich and long standing traditions. Cultural ecology (Frake 1962) posits that community relationships, either among persons, or between man

1) For quantified rather than perceived impacts of dams on downstream areas in the Mekong and other river ecosystems see Winemiller et al., (2016) and Kuenzer et al. (2013).

and biotic-physical constituents in his environment, all are “woven of cultural threads”. Following this notion, we take into consideration the role of culture as a vital component of the Mekong river bank ecological system. As such, the paper focuses on an under-researched dimension within the body of knowledge on Mekong studies.

This paper is structured as follows. First, it introduces the background and context of the issue by shedding light on the geographical significance of the Mekong River, the context of Chinese upstream activities, and on Chiang Rai Province. Then, the methodology is presented followed by the results. The findings suggest that the upstream Mekong activities conducted by China impose significant impacts on livelihoods and also generate prospects of the cultural loss to the riverbank community. In the discussion and conclusion, we reflect upon the findings and provide suggestions for further research.

Ⅱ. Background

1. Geographical significance

The Mekong River (hereafter just the Mekong or the River) covers the geographical length of 2,700 miles (or 4,350 kilometers) from Tibetan plateau in China to South China Sea via Vietnam, making it the tenth longest river in the world. Home of approximately one thousand freshwater species, the River is also well recognized for its biodiversity[2]. It accounts for 25 percent of global freshwater and

constitutes the largest inland fishery industry. Approximately, 87 per cent of the known species are migratory, and half of the catch are long-distance migratory ones (Baran 2009). It has large-scale seasonal flooding and thus produces large area of wetlands. The Mekong Basin can be divided into two parts - upper Mekong which includes China and Myanmar, and lower Mekong which encompasses Thailand, Laos, Cambodia and Vietnam.[3] The aquatic ecology in the Lower Mekong Basin (LMB) is thus characterized by the richness in species, wetlands, and fish migrations. In the context of Southeast Asia, the River is known to be the main 'blood vessel' for at least 60 million people.[4] River bank communities can be characterized by poor and rural population (Human Development Data 1990-2015). This implies that rural households are highly dependent on the river as their main sources for economic activities and protein consumption[5]. In other words, the river is central to food security and livelihoods of rural communities in the basin.

2. Upstream Mekong activities

Due to upstream activities, particularly dam construction as well

2) The number of species ranges between 768 and 1,200.

3) According to Mekong River Commission, under the whole basin approach China and Myanmar are regarded as 'upstream partners,' whereas the full members are comprised of those in the downstream.

4) The number of which is expected to rise over 100 million by 2025. See *Mekong River Commission*, www.mrcmekong.org/topics/fisheries/.

5) According to surveys in LMB, approximately 2.6 million tons of fish and aquatic animals were consumed by 56 million people in 2000. Hortle, Kent G. "Consumption and the yield of fish and other aquatic animals from the Lower Mekong Basin." *MRC technical paper* 16 (2007): 1-88.

as rapids and river islets explosion, environmental groups in downstream countries have voiced concerns regarding the direct impact on biodiversity, fishing, agriculture, and even national boundaries (Cochrane 14 May 2017). Also, there has been a gradually increasing awareness on riverbank livelihoods. <Table 1> shows the development of Mekong navigation channel improvement project between China and downstream countries. Upstream, eleven dams were completed as of January 2019, while six more are under preparation and planning process.

<Table 1> Timeline of Mekong navigation channel improvement project between China and downstream countries

Year	• Mekong channel navigation project
1992	• The Greater Mekong Subregion was established (Members: China, Myanmar, Laos, Thailand, Cambodia, Vietnam)
1994	• Thailand, China, Myanmar and Laos signed agreement on freedom of navigation in Mekong; boats are allowed to dock in member countries' ports
2002	• Thai authority approved EIA survey of the project (draft by China)
2002-2003	• Rapids and shallows dynamited at the Myanmar-Laos Mekong river bank
2003	• Rapids and shallow destruction halted; project suspended as a result of movement by local environmentalist groups and villagers
2016	• Xinhua reported that China and four ASEAN members prepared to revive the project to enable 500-ton ships to pass through • Chinese crew inspected Mekong river in Laos in November • In December, Thai government approved the project for 10 year-period (2015-2025)
2017	• Chinese crew inspected 96 km. of Thailand-Laos Mekong river bank in April • In December H.E. Mr. Don Pramudwinai, Minister of Foreign Affairs announced that China may stop the project
2019	• CCCC Second Harbor Consultant Co. Ltd company (中交第二航務工程勘察設計院有限公司) appointed TEAM Consulting Engineering and Management PCL to conduct opinion survey in Chiang Khong, Wiang

	Kaen and Chiang Saen Districts between January 3-5, 2019. • As a result of informal strategic consultation between State Councilor Wang Yi and Minister Don Pramudwinai, China "agreed to cooperate with the Thai side's proposal to terminate the said project" • Thailand's Marine Department hosted the 17th Meeting of Joint Committee on Coordination of Commercial Navigation on the Lancang-Mekong River among Chaina, Laos and Thailand: JCCCN on March 26-28.

Source: Buatong (2018); Team Group (2019); Ministry of Foreign Affairs of Thailand (2019)

<Map 1> The map illustrates overall dam constructions along Mekong or Lancang River. This paper subjects its study upon the impact of dams in upstream water upon downstream local people, representatively the communities in Chiang Rai Province, Thailand.

<Map 1> Completed dams (black) and location of Chiang Rai Province (red rectangle).

Source: Map modified from *Toward Ecological Recovery and Regional Alliance* (TERRA).

3. Context of Thailand: Focus on Chiang Rai

The borderlands where the Mekong waters also enter Thai territory is known as the 'Golden Triangle' including the tripoint of Myanmar, Laos, and Thailand.[6] The focus of this study is three districts of Chiang Rai Province - Chiang Saen, Chiang Khong and Wiang Kaen (<Map 2>) - which are made up of at least 39 villages hosting approximately 68 thousand population (<Table 2>).

<Map 2> The map illustrates three districts of Chiang Rai subject to the study

6) Leoi, Nongkhai, Nakonpanom, Mukdaahan, Amnajjaren and Ubonratchatani. The area covered in the basin is accounted for 184,000 square kilometers which constitutes 23 per cent of the total area of the basin and 36 per cent of the country area. Covering the population of 23 million in the basin area in Thailand (statistics in 2007), estimated per capita consumption of inland fish and other aquatic animals is 29.3 and 4.3 kilograms per capita per year respectively (statistics in 2000). It is also recognized that rice-field habitats that covers significant part of wetland areas also make a large contribution to consumption yield. "Mekong river basin." Aquastat. *Fao.rog*; Hortle, Kent G. "Consumption and the yield of fish and other aquatic animals from the Lower Mekong Basin." *MRC technical paper* 16 (2007): 1-88.

<Table 2> 2010 Population Census of eight sub-districts border to Mekong River

District	Sub-district	Population	Households	Villages
Chiang Saen	Wiang	11,334	6,024	9
	Ban Ngen	8,286	2,723	n/a
	Ban Saew	10,461	4,217	13
Chiang Khong	Wiang	12,521	5,057	11
	Sri Don Chai	8,754	3,149	n/a
	Rim Kong	6,222	2,104	n/a
Wiang Kaen	Muang Yai	7,118	2,399	n/a
	Lai Ngao	3,420	1,512	6
Total	8 sub-districts	68,116	27,185	min. 39

Source: Chiang Rai Census 2010 (National Statistical Office of Thailand)

Ⅲ. Methodology

To unravel the livelihood and community impacts of the upstream Mekong activities upon Chiang Rai riverbank villagers, this paper adopts a qualitative approach by analyzing secondary sources including field research, scholarly work, and interviews extracted from news articles, dated from 2004 to January 2019. Related to the case study alone, the paper analyzes altogether five scholarly works, twenty online news contents, and two documentary articles. Out of twenty news articles, ten are collected from traditional national daily newspapers, two from digital television channels, and seven from online-only news sites, five of which specialize in working with civil

society advocacy groups. Regarding documentary contents, the authors drew from *Silpawattanatam Magazine* which is a long established magazine on arts, traditions and cultures in Thailand. The study acknowledges the limitation of secondary sources as they may entail missing data and unclear boundary of impacts between districts. Although field research and primary data are commonly perceived to yield higher methodological values, secondary sources are highly valuable when selected based on appropriate criteria and offering new interpretation of the data. The selection criteria of sources are based on three significant elements.

First, the selected sources offer transcripts of field interview excerpts of the villagers living in targeted districts to allow one to reinterpret of primary data derived from the secondary sources. Second, the selection is drawn from various types of media to capture the diversity of perceived impacts. Impacts of dam construction upon communities and livelihoods are complex, particularly considering norms and beliefs shared among certain communities. Also, the impacts may differ from one village to another due to the distinct social and economic characteristics of different areas. Thus, selection of data aims to reflect the diversity of impacts without attempting to validate the representativeness or comprehensiveness of data. Lastly, the selection is scoped with local-level data. In other words, the chosen news contents and academic essays are wholly subjected to the accounts or studies at district or village level. Furthermore, since all data are derived from Thai sources, the methodology retains local insightfulness allowing the analysis to offer perspectives and discussions that have been displayed in Thai language based news

content and academic work, but are much less well-known in international academic work.

The scope of this paper is livelihood and community impacts. Livelihoods changes refer to changes in income, food situation, and other tangible indicators that relate to the standard of living (Kibler et al 2012; Lerer and Schudder 1999; Wang et al 2013). Community impacts focus on the study of social cohesion measurable by the evolution of social networks, community participation in civil society organizations, as well as cultural changes; both tangible aspect (e.g. changes of landscape of cultural sites) and intangible cultural assets (e.g. folklores and local beliefs).[7)]

Ⅳ. Analysis of perceived impacts and synthesis

1. Livelihood: Changes in sources of food and income

The analysis is conducted according to the two main ecological components of economic impacts. Regarding livelihood components changes in (1) quantity of algae and fish in the river and (2) the level of river indispensable for agricultural activities will be investigated. The resources in the river and farming along the river constitutes the main food staples of the population living near the river banks. Additionally, they also provide reliable sources of income from seasonal fisheries and agriculture. However, as the construction of

7) As this study has a qualitative character and is based on media content analysis, quantitative analyses are beyond the scope of this paper.

dams in upstream Mekong emerged, one can observe the changes in river resources and the overview of which is summarized in <Table 3>.

<Table 3> Timeline of dam constructions in Mekong upstream in China and its impacts on livelihood in Ban Hua Wiang village

Dams on Mekong Upstream (in China)	Start of construction	End of construction	Impacts on livelihood
1. Manwan	1986	Phase 1 - 1995 Phase 2 - 2009	1991-2: Some observable changes in Mekong. More difficult to fish 1997: decreasing number of fish; unseasonal change of water level imposes difficulties to fishermen 2001: increasing muddiness, rapid changes of Mekong ecological system 2008: unnatural tidal rise and fall of water level making seasonal fishing difficult, migrate to low land for agriculture; declining amount of kai 2010: increasing number of kai 2011: fishermen started to move to labor sector, kai harvesting period shortened due to quick rise of river level 2012: unusual change of tidal water level, increasing villager looking for alternative jobs 2013: Mekong crisis, sewage 2014: need careful observation of rise and fall of water level, continuous increasing of villager moving to different job sector 2015: kai harvesting period shortened 2016: kai harvesting period fell to one month 2017: kai harvesting period fell to three days; oil slick observed
2. Dachaoshan	1994	2007	
3. Jing Hong	2002	2009	
4. Xiaowan	2002	2010	
5. Nuozhadu	2008	2012	
6. Gong Guoqiao	2008	2012	
7. Miaowei	2010	2018	

Source: Modified from Mankong and Ratchtani(n.d.)

First, the study on the changes in river algae is well demonstrated in Mankong and Rachtani's research. Their primary case study dealt with the change in quantity of 'kai' (Mekong river algae or

Cladophora spp.) and its impact on livelihood of Ban Don Hua Wiang village in Chiang Khong District. *Kai* is recognized to be vital sources of living not only for people, but also for fishes in the river. The algae grow in shallow, clear spots of water or on rocks in the slack water which shows its needs of sunlight for photosynthesis. It is most abundant during the dry season which falls between November and May in Northern Thailand. The algae are rich in nutritional value with high protein, beta carotene, vitamin B1, B2, B12, iron and calcium (Peeraponpisa 2010). In addition to daily consumption, it has recently also been extracted to be nutritional supplements or even cosmetic products. This has significantly added value to the algae market (Teaw 2014). Due to the recent decline in supply and increasing demand once its nutritional values were discovered, the prices of algae and processed products rose dramatically (Sonbali and Jaidee 2014). From being a basic food staple for villages, Kai has become a consumption good affordable only for special occasions. In the past, villagers were able to collect kai directly from the river for consumption.

The declining number of kai does not only result in the loss of available food and nutrition villagers consume, but also directly reduces incomes. Most villagers belong to the informal labour market which provides them unstable incomes. Thus harvesting kai has become a vital, alternative source of stable of income. The survey result of this field research depicts that the availability of kai has significantly declined in recent decades. Thirty-forty years agoit was possible to harvest kai every day for three months long (Mankong and Ratchtani n.d.). The harvesting season nowadays is shortened to

only approximately a month. Also, the rapid rise of water levels and muddiness inhibits villagers to collect kai from the river (Prachachat 2017). Other factors that may have contributed to the declining number of kai are stronger tidal currents, oil slick, and the construction of riverbank protection (Ibid). An example of this drastic change from villagers' account was in 2016 when people were able to harvest kai only for three to four days before the water level rapidly rose (Ibid).

Thus kai generates a source of alternative income for a number of villagers, owe to its endowment and predictability to harvesting period in the past, the algae is a source of main income particularly for women. Harvesting kai requires low capital investment as it is grown naturally in the nature. Also, the activity does not require high physical workforce or a long time to harvest. This provided stable income for women in the riverbank communities. Furthermore, kai has been a significant binding force of women to organize and empower themselves as seen in the case of Farm Woman Group in Ban Hat Krai village in Chiang Khon Province[8]. The Group has worked towards the value-added creation of kai products that raise the price from four- to tenfold of the fresh kai. The work annually creates approximately 30,000 - 40,000 baht or 900 - 1,200 dollar per member, and payment for work values 150 baht or 4.5 dollar per day (Mankong and Rachtani n.d.). That is, income level and social cohesion among female villagers are disrupted in this event.

8) In 1999 Chiang Khong housewife association for Kai products was established. The group is supported by Chiang Mai University and Ministry of Agriculture. In 2009 representative members were sent to get training in Japan to learn food processing.

Highly sensitive to the change of river algae, the quantity of Mekong River fish also dramatically declined due to changing source of food and nutrients and changing river level and sediments unlike its natural cycle. The growth of kai creates a buffer for nutrient accumulation in the water body (Power 1990). The change of nutrients level and aquatic plants directly affect the food webs for fish. Additionally, there has been speculations that the turbulent water flowrate and unusual rise-fall of water level affected the fish to migrate to lower downstream of the river (Shusho 2014). The impact is directly felt by villagers in Chiang Khong saying that it became extensively more difficult to fish in Mekong and almost impossible to buy such river fish as the price rose approximately eightfold - from 50-60 baht to 400 baht per kilogram (Mankong and Rachtani). The similar trend can also be observed in Wiang Kaen district. According to an interview with fisherman in Ban Huai Leuk village, the fall in quantity of fish and the shift of sites for fish to lay egg are observable, while the rapid rise of water level also destroyed fishing equipment (Voice TV 2018). Legal effects from the agreement on Mekong Navigation channel improvement project are also expected to inhibit local people from conducting traditional fishing because such activities may deem to hamper the navigation of commercial boats to the agreement (Bbc News Thailand 2016).

Agriculture along the river bank is also crucially affected, particularly in Chiang Saen and Chiang Khong districts (Foundation for Ecological Recovery 2007; MThai News 2010). Agriculturers who farm along Mekong river bank experienced severe drought and low water level in 2007 (Ibid). Another event that caused fear for severe

drought was when the Marine Department made an announcement that China's dam repairing activities could cause the water level to drastically dry out (Butrkod 2014). Apart from drought impact upon river bank farming, floods also impose another challenges. One of the most striking loss from unnatural, rapid flood was seen in August 2008; the catastrophe hit 38 villages and incurred economic damages of over 85 million baht[9]. In August 2018, Mekong water level rose rapidly due to the continuous rainfall and speculated drainage from Chinese dams causing floods in Ban Sobkam village and Ban Takantong village (in Chiang Saen). More than 50 households were affected and a number of land transportation routes were cut (Manager Online 2008; Naewna 2018). Cornfields along the bank and farms on islets were reported to be destroyed (Ibid). And in March 2015, water drainage at the rate of 2,300 cubic meter per second for two days long from Jing Hong dam caused a flood damaging vegetable farms in Chiang Khong (Post Today 2015). Farmers in the area expressed that their vegetation on river islets that emerge in dry season were also flooded before.

To summarize, dam constructions and navigation channel improvements have affected the livelihoods of population along the Chiang Rai river banks to a considerable extent; most notably in terms of food insecurity, loss of income, and damages from floods and droughts. There is an obvious decline of food staples and river-based income generating opportunities (i.e. kai and fish), as well as on land - farming along the bank and on islets. This has caused villagers to

9) Survey data was collected by a local NGO, Love Chiang Khong Group (Prachatai, 2008).

move to or increase working hours in different sectors of the labour market which could eventually encourage permanent out-migration. Lower harvests and higher dependence on food markets have put many households in a more difficult position. The livelihoods prospects of villagers may appear pessimist due to relatively low levels of knowledge and capacities to adapt or take advantage in due time from the special economic zone (Chuaduangpui 2019). The Chiang Rai Special Economic Zone (CRSEZ) is a government-initiated development supported under the larger framework of Special Economic Development Zones (SEZ). CRSEZ covers three districts of Chiang Rai - Chiang Khong, Chiang Saen and Mae Sai - which are seen as conducive to trade and investments due to their strategic location on the North-South Economic Corridor, connecting Northern Thailand to Southern China via two routes - Chiang Khong-Laos and Chiang Saen-Myanmar (Board of Investment Thailand 2015). The project is aimed at turning the area into a hub for trade, tourism and logistics.

2. Community: Changing dynamics of social identity and cultural loss

The second theme analyzed in this paper is concerned with the well-being of the river bank communities. Three issues are discussed in this section - (1) community's identity, (2) intangible cultural loss, and (3) tangible cultural loss. As mentioned in the introduction this is a theme that has been relatively under-researched and thus deserves more attention. Although there has not been a complete loss of these

cultural elements, the rising discussion on this issue in the media reflects increasing public awareness. The preservation of cultural assets has become a prominent topic among Thais due to its potential value added for the tourism industry. The “Mekong cultural relations” event where cultural performers from China, Laos, Myanmar and Thailand hold a cultural showcase together in Chiang Rai is one obvious example that Thai provincial authority pushed for a large-scale performing attraction to draw in tourists (Manager Online 2014). Beyond the loss of market values to tourism industry the loss of cultural assets will disrupt the community’s cohesiveness that is grounded in shared values, beliefs and identity. Shared memories and social rhythms constructed by seasonal rites and traditions throughout different generations of people are one vital source of individual’s sense of belongingness to a particular community.

The district named Chiang Khong exemplifies the identification of its geographical space to Mekong River. *Chiang* is northern dialect literally means ‘town’, while *Khong* refers to Mekong River. The fading of cultural assets in Chiang Khong district, thus, illustrates a blatant case for potential threat to communal identity. The Mekong River and Mekong giant catfish are the community’s pride, particularly to Ban Hat Krai villagers as the catfish is most abundant in the village’s riverbank. With the increasing perceived threats to the River, on 12 January 2019, the Mekong-Lanna Natural Resources and Culture Conservation Network, Chiang Rai Inland Aquaculture Research and Development Center, and villagers from Ban Hatbai (บ้านหาดบ้าย) and Ban Hatsaitong (บ้านหาดทรายทอง) have organized a religious ritual to prolong life of the River (Living River Siam Association

2014). At the ceremony, Buddhist monks gave prayers to the River and participants released fish to the River. Nonetheless, the ongoing conservation efforts of the species, for instance by means of the make of breeding place and education for the local people (Tanakit 2013), have made the local people feel less threat to this community's identity asset.

To address the potential cultural loss, which correlates with communal identity, one may first observe the tangible cultural assets, including, but not limited to, shrines, fish traps, and dugout boats. Villagers have expressed their concern on the damage or submergence of *Prataat Ya-Mon or Prataat Doi Mae Ya-Mon* (พระธาตุย่าม่อน/ พระธาตุดอยแม่ย่าหม่อน), a religious site to worship *Naga* and *Ya-Mon* based on traditional, local myth in Chiang Khong (Photo 1). A public opinion survey on navigation channel enhancement project was conducted by Team Group[10], which illustrates the villagers' concerns for the preservation of such religious site. According to a study on fishing practices conducted by Thai Baan Research, 69 different types of traditional fish traps were found in Chiang Khong district (Living River Siam Association n.d.). According to an interview with Pui Bubpa, dugout boats were majorly used which are now being replaced by motorboats (Pulaiyao 2004). Due to the declining fish stocks and increasing risks from tides made by large motor vessels, wooden boats are gradually vanishing from the fishery scene. An interview with Manit Saengpet, a local boatman who provides commuting

10) TEAM Consulting Engineering and Management Public Company Limited; The participants of the survey include three sub-districts (Ban Ngen, Ban Saew and Sri Don Chai)

service for people crossing the River, also revealed that merely docking boats in the water already expose to risks of damages from the cargo ships (Thai Channel 8 2017). These examples of tangible cultural assets are, moreover, embedded with beliefs and traditional intellects that have allowed traditional society to live in balance with nature.

Intangible cultural assets under threat amid the changes in Mekong ecology are related to local folklores and traditional rites surrounding fishery activities. A common folklore among Mekong riverbank communities is known to be the story of *Naga* or the King of cobra that is believed to be the deity of Water and Snake residing in Mekong. Ya-mon, which literally means grandmother 'Mon'. It is believed to have rescued Naga from fishnet but in turn controlled the navigating route of Naga as well in order to prevent it disturb boats or fisheries in Mekong. This folklore is prevalently known by Chiang Khong residents and is used as a tool to warn people not to swim or to be more cautious when sailing in the river spots of strong tidal currents. Every year local residents collectively conduct a worshiping rite to *Naga* and *Ya-mon*. The village chief of Ban Pak In village, Prachit Chanpen, expressed that the change of navigation channel of Mekong will devalue faiths that local people uphold to *Ya-mon* and *Naga* (Transborder News 2017). The folklore also reveals the dangerous spots of the River, illustrating traditional ecological knowledge about the watercourse. A village chief expressed concerns that the change of Mekong ecology will make this traditional knowledge no longer application, putting higher risks to boatmen when commuting (Ibid).

<Photo 1> *Ya-mon* worshiping site (Left) and *Naga* worshiping site (Right). Prataat Ya-Mon site is located at the river bank, and is therefore exposed to direct risk of being damaged by floods or navigation channel expansion.

Sources: TransborderNEWS(2017), Siamrath(2018), Post Today(2017)

Regarding traditional rites surrounding fishing activities, the most prominent ones are the worship for giant catfish (พิธีกรรมบวงสรวงปลาบึก; Piteebuangsuang Plabeuk) and the worship for the boat's guardian spirits (พิธีไหว้แม่ย่านางเรือ; Piteewai Maeyanangruea). Fishers in Mekong have strong ties with their boats through animistic beliefs. They believe that each boat has its guardian spirits protecting the vessel's owner from disasters and blessing them for a plentiful catch. According to Pui Bubpa's account, each time before fishing, a fisher will pray to the spirits asking for fortune, and vow them to make offerings in return if his prayer comes true (Pulaiyao 2004). Fishers pay high respect to their boats in that they refrain from insulting, spitting, and knocking the paddle on the boat as they avoid to the spirits. Piteewai Maeyanangruea is conducted, first, to welcome any new boat and second, to repay after each catch by providing offerings, such as, chicken and liquor.

With respect to Piteebuangsuang Plabeuk, the field research by Uraiwan Chaiyamin elaborates on the traditional practice of worship ceremony. Chaiyamin describes that the worship called Pitee Pa (พิธีป่า; rite in the forest) took place four to five days after Songkran day (Thai new year day), and the location was one kilometer away from village where a small shrine of guardian spirits was located[11]. To preserve the sacredness of the ceremony, participants inthe worship were exclusive to the giant catfish hunters only. The worship of different hunting groups were conducted separately where each group consisted of four to six members[12]. Half of the catch would go to the vessel owner, a quarter to the observer, and another quarter to the assistant. According to Ong Banjung's account on giant catfish worship, the rite is based on the local folklore saying that giant catfish is an ordained fish (Banjung 2012). As the giant catfish is herbivore, villagers came to believe that the creature observed the (Buddhist) Precepts and are thus protected by the guardian spirits called "Chaopong Chaoluang" (เจ้าโพ้ง เจ้าลวง; God Pong and God Luang). The sacrifice made at the worship is, hence, believed to be communicating channel to the river deity to ask for fishing permission. So far, there is no written record of how the worship practice came to exist or when it started. The earliest record only describes that around 1877

11) As opposed to 'rite in the forest', since 1996 the worship ceremony has become provincial-scale event called Pitee Muang (พิธีเมือง; literally translated as rite in the city) with a large, newly built shrine along with musical parade and cultural showcase as to promote tourism. The start of the tradition change is also said to be partly due to Prince Akishino's visit to Chiang Rai in 1996. Ever since the worship ceremony has been set to fall on April 18 every year to attract tourists.

12) Traditionally, hunters observed the river tide as an indicator to identify where the fish locates. Each member was allocated with different tasks such as sailor, tide observer, and assistants.

an aged man named Nanta Yongyeun (หนานตี๊ะ ยงยืน) was the worship leader at that time. Relying on traditional hunting tools like trident, hunters require experiences and skills; hence successful catch would bring prestige to the hunter.

The cultural ecology, comprised of both tangible and intangible cultural assets, is not only significant to the communal identity and social cohesiveness, but also important to health of the individuals as reflected in the research "The Belief in Worship for Giant Catfish and its Implication to the Well-being of Ban Hadkrai Villagers" (Chaiyamin n.d.). The field interview with Ta Tun (grandpa Tun) demonstrates how the absence of traditional worship and folklore beliefs that have embedded in his cognitive schema have disturbed well-being. Ta Tun believes that the factor contributing to his illness must have been that the giant catfish deity became angry and, thus, punished him because he quit his job as an assistant to Piteebuangsuang Plabeuk. He described that the fact that he has stopped conducting for years must have been perceived as disrespect act by the River spirits. Ta Tun deliberately explained that the spirits appeared in his dream, saying that they will go after his family members. The story of Ta Tun illustrates that a custom revolving around supernatural power is critical to the physical, mental, and spiritual wellbeing of community members who share the beliefs.

Interestingly, the navigation channel improvement project has raised higher public awareness and discourse on cultural loss than that of identity loss. In this regard, the collective perception of threats to the community's culture and faith has brought a new dynamic to social cohesion. Artists and media groups have collaborated to film

and record that changes of the river area in Chiang Khong. Furthermore, five civil society groups have held “Homboon Hompoy” cultural event in Wiang sub-district which aimed to demonstrate the self-determination of local people against the navigation channel enhancement project (Thairath 2017). The event can be seen as a continuous effort of the local people to gather petitioner list calling for an end to such disturbing projects. They could gather list of 3,715 petitioners from online campaign, and could attract 800 additional petitioners from the campaign represented at the event; 300 of which donated to the Mekong Protection Fund (Ibid).

Ⅴ. Discussion and conclusions

The paper has illustrated the perceived social impacts of upstream Mekong dam constructions and navigation channel improvement projects which are prominently pronounced through the disruption of income source and food stable acquired from Mekong River resources. River geography and hydrology is significant to biodiversity, and thus, to the traditional livelihood of people who are dependent on the resources in the water. Dam constructions and navigation improvement projects in the upstream have altered the natural cycle of flood recession - dry season - flood recession periods on which fish migration depends. This brought about the ecological change that consequently affects the food web of which river bank communities are beneficiaries.

The perceived threats to the community’s ecology have

reinvigorated activism of local civil society, and hence, could be seen as a positive to social cohesion. The case of Chiang Rai only reflects the issues risen in one among eight riparian provinces. The other seven provinces located in Northeastern Thailand have been encountering no less serious problems with an anticipation of more dams blocking Mekong River to be constructed in Laos. The Xayaburi dam (ເຂື່ອນໄຊຍະບຸລີ) has been at center of attention partly due to its close proximity to the Northeast, and partly due to the involvement of Thai shareholders (75%)[13], Thai construction companies, and the Thai power purchaser - Electricity Generating Authority of Thailand (EGAT)[14].

In comparison to the Chiang Rai case, Mekong River communities in Northeastern provinces are seen to have experienced extreme changes of water level leading to similarly negative impacts upon economic activities and food staples. According to Chainarong Setchua of Mahasarakham University, the Mekong River banks along Nongkhai, Beung Kan and Nakhon Phanom used to make up the areas of best agricultural condition in the Northeastern region. Natural and predictable rise and fall of river enable the riverbank communities to sustain their living and earn from vegetables, palm and tobacco leaf farms as well as aquaculture. The River not only feeds people

13) Xayaburi Power Company Limited is comprised of shareholders as follows – CK Power Public Company Limited (25%), Natee Synergy Company Limited (20%), Électricité du Laos - Generation Public Company (20%), Electricity Generating Public Company Limited (12.5%), and others (5%). ("Xayaburi Power Company", *Ckpower.co.th*)

14) Despite opposition from Thai locals joined by the Cambodian and Vietnamese (Vandenbrink 2012), the project was pushed through, and in fact, already started selling electricity to EGAT (Thairath 2019).

in the region, but also constitute important export products, such as currant tomato and chili (Prachatai 2016). There are also increasing concerns regarding tourism. While Chiang Rai communities fear for the loss of cultural assets which serve as their core tourist attractions, the Mekong communities in the Northeast perceive threats to their tourism income more from the disturbances on nature itself, such as river beaches (Thai PBS 2016, Abhisakulchat 2018).

Combining the insights from the perceived livelihoods and community impacts generates an interesting paradox: The changing Mekong ecology leads to an erosion of local cohesion in the economic sphere, but to a strengthening and empowerment in resistance against government decisions and policies. The erosion in the economic sphere does not spill-over to the community, social, intangible sphere. River bank communities perhaps realize that economic realities are undoubtedly changing and might even migrate to other places, yet they resist giving up their social traditions, traditional ecological knowledge, and beliefs. Although the findings shed light upon positive aspects of social cohesion and the rise of local civil society, the development of such social activism is deemed limited and constrained amid the pre-2019 election period in Thailand. The activities of *Love Chiang Khong Group* were constantly monitored by military officers. The Peace and Order Maintaining Command (POMC) called the leader of the Group to visit ‘for discussion’ as well as observed the Group’s gathering against Chinese ship’s exploratory navigation (Manager Online 2017, Prachatai, 2018).

The results laid bare in this paper reflect problems in policy-making

processes with respect to (1) failures to engage with the local population; (2) a strong focus on economic gains at the macro-level; and (3) weak communication with local communities regarding forthcoming ecological changes. Although the decision of Mekong dam constructions is outside Thailand's jurisdiction, Thai authorities have full power to decide whether to cooperate in the Commercial Navigation project. Based on the results we put forward two policy recommendations. First, at the domestic level given the opportune momentum from Thai's agreement to terminate the Commercial Navigation project, Thai local authorities should apply 'development' projects, either domestic or international, in a manner that embraces local opinions and community engagement. As our analysis specifically reflects the significance of cultural assets to community livelihoods, policymakers should include cultural losses and traditional ecological knowledge into existing frameworks of environment impact assessments. The paradox described above demonstrates that policymakers need to deploy a more holistic perspective when considering the future of the Mekong River Basin. Kate Ross (2017) remarked with respect to traditional sustainable fishing methods in Southern Laos: "The destruction and loss of Li traps in Siphandone is emblematic of the larger-scale loss of local knowledge, culture and history as a result of hydropower development and other large-scale infrastructure projects in the Mekong River Basin." In other words, rather than narrow environmental impact assessments, we suggest *socio-ecological* impact assessments. This would imply a stronger focus on the plight of riparian populations and the inclusion of non-tangible, cultural factors.

At the international level Thailand still needs to make sure that it will not to be excluded from any multilateral decision-making table. Improved predictability and consistency of rise and fall in water levels is crucial for the livelihoods of riverbank communities. Thus, along with other Greater Mekong Sub-Region countries, Thailand should negotiate with China to share their long-term plan on water level management. Sincere data sharing, higher external accountability, and willingness to compromise and listening to problems from downstream countries will yield a more sustainable cooperation and benefits for all stakeholders. Considering China's increasing attention to 'benign image' construction (Shambaugh 2015) and Thai's growing social cohesion, the now-elected government may make use of civil society organizations' activities to indirectly pressure China, and engage them in Mekong governance.

We recognize its limitations as it selectively focuses on livelihoods, social and cultural change aspects of social impacts from dam constructions. To obtain a fuller picture of dam construction impacts in the upstream - downstream relations, subsequent research is encouraged to adopt a holistic analytical framework combining qualitative and quantitative methodologies. Finally, as the findings of the paper suggest that the negative impact of livelihood may induce out-migration, detailed studies on communities' self-help adaptation strategies and the impact of migration would cast a more comprehensive perspective on livelihood trajectories and social changes.

Appendix

<Appendix Table 1> List of hydropower stations in upstream Mekong/ Lancang

Yunnan Province云南省		Tibet's Lancang area澜西藏段
Fully operated	Started operations but not of all units[15]	Under planning and preparation
1.Manwan漫湾水电站(1995)[16]	8.Huangdeng黄登水电站	12.Guxue 古学
2.Dachaoshan 大朝山水电站(2003)[17]	9.Wunonglong Dam 乌弄龙水电站	13.Cege 侧格
3.Jinghong 景洪等水电站(2009)[18]	10.Lidi Dam 里底水电站	14.Yuelong 约龙
4.Xiaowan 小湾水电站(2010)[19]	11.Dahuaqiao - 大华桥水电站	15.Rumei 如美
5.Gonguoqiao 功果桥水电站(2012)[20]		16.Banda
6.Nuozhadu糯扎渡水电站(2014)[21]		17.Kagong 卡贡
7.Miaowei 苗尾水电站(2018)[22]		

Two more dams worth mentioning are Ganlanba and Mengsong dams. The sealing order of Ganlanba (橄榄坝航电枢纽) was issued since 2009 but has not been able to start construction (Local Government of Xishuangbanna 2018). On the other hand, in 2010 Mengsong dam was declared to be cancelled to the Mekong River Commission.

15) Xinhuanet 2019
16) Dlzb.com n.d.a
17) Changjian Water Resources Commission of the Ministry of Water Resources 2005
18) Huaneng Lancang River Hydropower Incorporation 2017
19) China Huaneng Group 2012
20) China Huaneng Group 2016
21) Dlzb.com n.d.b
22) Yunnan Daily Press Group 2018

References

Changjiang Water Resources Commission of the Ministry of Water Resources. 2005. 大朝山水电站多年非法取水得以纠正." http://www.cjw.gov.cn/zwzc/gljd/468.html (accessed March 30, 2019)

China Huaneng Group. 2012. "小湾水电站概况 - 中国华能集团." http://www.chng.com.cn/n31531/n507564/n874703/c874858/content.html (accessed December 10, 2018)

_____. 2016. "功果桥水电站." http://www.chng.com.cn/n31531/n31611/n1415310/c1586116/content.html (accessed April 27, 2019)

Dlzb.com. n.d.a. "漫湾水电站." 中国电力设备信息网 合作电厂. https://mwsd.dlzb.com/ (accessed April 15, 2019)

Dlzb. n.d.b. "糯扎渡水电站." 中国电力设备信息网 合作电厂. http://mzdsdz.dlzb.com/ (accessed April 15, 2019)

Huaneng Lancang River Hydropower Incorporation. 2017. "华能景洪水电站." http://www.hnlcj.cn/view/hnlcmb/8/523/view/1702.html (accessed April 15, 2019)

Local Government of Xishuangbanna. 2018. "西双版纳州移民开发局关于政协西双版纳十二届二次会议解决橄榄坝电站修建涉及职工移民搬迁问题提案(第65号)的答复." 西双版纳傣族自治州人民政府. https://www.xsbn.gov.cn/245.news.detail.dhtml?news_id=55092 (accessed April 15, 2019)

Xinhuanet. 2019. "四座水电站机组同日投产 华能澜沧江公司"一日四投"创纪录." http://www.xinhuanet.com/power/2019-01/04/c_1210030313.htm (accessed April 15, 2019)

Yunnan Daily Press Group. 2018. “苗尾水电站四台机组全部投产发电.” http://yn.yunnan.cn/html/2018-06/09/content_5245843.htm (accessed April 15, 2019)

Abhisakulchat, Tawee. 2018. “Shaopudluinamgrab··· ชาวพุทธลุยน้ำกราบ พระบาทกลางแม่โขง เหตุจีนปล่อยน้ำกลบมิด. [Buddhists Forded into the River to Pay Respect to Buddhapada···].” *77kaoded.* https://www.77kaoded.com/content/80328(accessed November 10, 2018)

BBC News Thailand. 2016. “Konlumnamkong kan mattikoromo hai jeenraberd kokeng dernrua sin ka 500 ton คนลุ่มน้ำโขงคัดค้านมติ ครม. ให้จีนระเบิดเกาะแก่งเดินเรือสินค้า 500 ตัน [Mekong Riverbank Communities Protesting Against Government’s Approval on China’s River Expansion Project to Accommodate 500-ton Boats].” https:// www.bbc.com/thai/thail and-38448207 (accessed November 10, 2018)

Butrkod, Chuleepon. 2014. “Witokjeen pidsomkuan-maenamkonglo-dhuab kasedtagonwanpailaeng runraengnairob 15 pi วิตกจีนปิดซ่อมเขื่อน-แม่น้ำโขงลดฮวบ เกษตรกรหวั่นภัยแล้งรุนแรงในรอบ15ปี [The Most Severe Drought for Mekong in 15 Years due to Chinese Dam Repair].” *Thai Civil Rights and Investigative Journalism.* https://www.tcijthai.com/news/2014/12/scoop/38 39 (accessed November 10, 2018)

Chaiyamin, Uraiwan. n.d. “Kwancheuapeetee buangsuang plabuek: kwammaitor sukkapawakongkonbaanhadrai ความเชื่อพิธีกรรมบวงสรวงปลาบึก: ความหมายต่อสุขภาวะของคนบ้านหาดไคร้ [The Belief in Worship for Giant Catfish and its Implication to the Well-being of Ban Hadkrai Villagers].” *Health Systems Research Institute.*

Charusupawat, Chanchira. 2010. “Saraikai OTOP Shanlert feemeuklummaebaanhadhadkrai” สำหร่าย ไกโอท็อปชั้นเลิศ ฝีมือกลุ่มแม่บ้านหาดไคร้. [Kai Premium OTOP Products by Housewife Groups].” *Komchadluek.* http://www.food4change.in.th/ariticle/news-launcher/good-news/398-qq-qq26.html (accessed December 10, 2018)

Chuaduangpui, Chonnipa. 2019. “‘Plabuek’ Rachineehaengmaenamko-ng chatakampayuhaengkantamlai” ‘ปลาบึก’ ราชินีแห่งแม่น้ำโขง ชะตากรรมบนพายุแห่งการทำลาย [‘Giant catfish’ the queen of Mekong and its fate after disrupts].” *Way Magazine.* https://waymagazine.org/tropical-storm-pabuk/(accessed April 10, 2019)

Foundation for Ecological Recovery. 2007. “Namkongheng tampramong kasedrimkongwun น้ำโขงแห้ง’ ทำประมง-เกษตรริมโขงวุ่น [Dry Mekong Troubles Fishermen and Agriculturers].” http://www.terraper.org/web/th/node/805 (accessed December 10, 2018)

Living River Siam Association. n.d. “Krongkan nitassakan kluantee plalaekreungmuehapla lummaenamkong: kuamchuamyongko-ngpukonlaesainam โครงการนิทรรศการเคลื่อนที่ ปลาและเครื่องมือหาปลาพื้นบ้านลุ่มน้ำโขง: ความเชื่อมโยงของผู้คนและสายน้ำ [Mobile Exhibition Fish Species and Traps of Mekong Subregion Community: Relationship between Peoples and the River].” http://www.livingriversiam.org/4river-tran/4mk/mek_fishing-gear-exhibition.html (accessed December 10, 2018)

_____. 2014. “Seubshatta maenamkong สืบชะตาแม่น้ำโขง [Prolong life of Mekong].” http://www.livingriversiam.org/4river-tran/4mk/

mek_a55.html (accessed December 9, 2018)

Manager Online. 2008. “Namkongtalug tuambanreun peunteekared rimfang siahaiyab น้ำโขงทะลักล้น-ท่วมบ้านเรือน-พื้นที่เกษตรริมฝั่งไทยเสียหายยับ [Flooding Mekong Damaged Houses and Farms].” https://mgronline.com/local/detail/9510000094870 (accessed December 11, 2018)

_____. 2014. “Reumlaew ngan wattantam sumpan lumnamkong thai-pama-lao-jeen konnaksadaeng showtem เริ่มแล้วงานวัฒนธรรมสัมพันธ์ลุ่มน้ำโขงไทย-พม่า-ลาว-จีน ขนนักแสดงโชว์เต็ม [Mekong Cultural Relations Event Set-off, Bringing Performers from Myanmar-Laos-China].” https://mgronline.com/local/detail/9570000146184 (accessed December 10, 2018)

_____. 2017. “Jaonateekottid klumttanreuacheen…” จนท.เกาะติดกลุ่มต้านเรือจีนสำรวจน้ำโขง ส่งคนหารือแกนนำถี่ยิบ. [Officers Monitor the Group Protesting against China’s Navigation Survey Ship].” https://mgronline.com/local/detail/960000004 2146 (accessed November 19, 2018)

Mankong, Aiyari and Arita Rachtani. n.d. “Kanplianplengkongkai laeponkratobtorchumchon: koranee banhuawiang ampeochiangkhong jangwadchiangrai การเปลี่ยนแปลงของไกและผลกระทบต่อชุมชน: กรณีบ้านหัวเวียง อำเภอเชียงของ จังหวัดเชียงราย [Change of Kai and its Impacts to the Community: Case Study of Ban Hua Wiang Village in Chiang Khong District, Chiang Rai Province].” *Mekong Community Institute http://www.mekongci.org/* images/work-mekong/report-kai.pdf (accessed November 24, 2018)

MThai News. 2010. “Maenamkongheng Jeenkaktonnam gratob

thai-lao แม่น้ำโขงแห้ง จีนกักต้นน้ำ กระทบ ไทย-ลาว [China Blocking Water Flow Affecting Thai-Laos].” https://news.mthai.com/webmaster-talk/68639.html (accessed November 25, 2018)

Naewna. 2018. “Chiang Rai kratob namkong talugtuam cheuatonhedjak fontalom jeenploinamkeuan เชียงรายระทม!'น้ำโขง'ทะลักท่วม เชื่อต้นเหตุจากฝนถล่ม จีนปล่อยน้ำเขื่อน [Flooding Mekong Damaging Farms].” https://www.naewna.com/local/ 354564 (accessed December 5, 2018)

Ong, Banjung. 2012. “Kunkaplabuekteesinmonklang meuapeeteebuangsuang gointer คุณค่าปลาบึกที่สิ้นมงนต์ขลัง เมื่อพิธีบวงสรวงปลาบึกโกอินเตอร์ [The Declining Sacredness of Giant Catfish when the Worship is Internationalized].” *Silpawattanatam. https://www.silpa-mag.com/history/article_ 57*54 (accessed November 14, 2018)

Peeraponpisan, Yuwadee. 2007. *Saraikai: kwanmrootuapai laekanpraeroob arharn สาหร่ายไก: ความรู้ทั่วไปและการแปรรูปอาหาร [Kai: Basic Knowledge and Processed Food]*. Bangkok: The Thailand Research Fund.

Post Today. 2015. “Odkeuanjeen ploinamtuam peunteekased siahai “โอดเขื่อนจีนปล่อยน้ำท่วมพื้นที่เกษตรเสียหาย [Dams Cause Flooding to Agriculture].” https://www.posttoday.com/social/local/351701 (accessed December 2, 2018)

_____. 2017. “Klumrakheu laireuajeen samruad raberdkengmenamk-ong กลุ่มอนุรักษ์ฯเฮือไล่เรือจีนสำรวจระเบิดแก่งแม่น้ำโขง [Environme-ntalist Group Against Chinese Inspection Boat for the Project].” https://www.posttoday.com/social/g eneral/ 474472 (accessed December 7, 2018)

Prachachat. 2017. “Chiang Rai ttuenrabmeu namkonghuabhab… เชียงรายเตือนรับมือน้ำโขงขึ้นดงฮวบฮาบ หลังจีนเตรียมระบายน้ำเท่าระดับเดิมหลังซ่อมเขื่อนเสร็จ [Chiang Rai Warn Mekong Level Dramatically Dropped After China had Finished Repairing the Dam and Prepared to Normalize its Drainage Level].” https://www.prachachat.net/local-economy/news-63931 (accessed December 3, 2018)

Prachatai. (2008). “Raingan: wikritnamkongtuam…รายงาน : วิกฤตินำ้โขงท่วม … [Report: Mekong Flood Crisis].” https://prachatai.com/journal/2008/08/17766 (accessed May 9, 2020)

_____. 2016. “Puamnuaykankruakaipalangngang… ผู้อำนวยการเครือข่ายพลังงานชี้จีนใช้แม่น้ำโขงเป็นเกมการเมือง-ต่อรองอำนาจกับประเทศท้ายน้ำ นักวิชาการระบุทำลายแหล่งเกษตรกรรมที่ดีที่สุดในอีสาน [Director of Energy Network…].” https://prachatai.com/journal/2016/03/64785 (accessed November 8, 2018)

_____. 2018. “Jaonateekaokui… จนท.เข้าคุยอาจารย์ ม.มหาสารคาม ปมจัดสัมมนาวิชาการ ถามทำไมไม่แจ้งทหารก่อน. [Officers Calling for Notice Before Organizing Seminars at Mahasarakham University.” https://prachatai.com/journal/2018/04/76628 (accessed November 22, 2018)

Pulaiyao, Sumatr. 2004. “Saisampankon gab maenamkong สายสัมพันธ์คนกับแม่น้ำของ [Relations between People and Khong River].” *Silpawattanatam*. https://opac.psu.ac.th/BibDetail.aspx?bibno = 249374 (accessed October 18, 2018)

Shusho, Chomcheun. 2014. “Planamkong yaitinneekeuan? ปลาน้ำโขงย้ายถิ่นหนีเขื่อน? [Mekong Fish Escaping Dams?].” *Thairath*. https://www.thairath.co.th/content/439227 (accessed November 29, 2018)

Siamrath. 2018. “Sampad sanae muangrimnamkong สัมผัสเสน่ห์เมืองริมน้ำโขง | ชมวิถีเรียบง่ายคนเชียงของ [Livelihood of Chiang Khong People].” https://siamrath.co.th/n/33338 (accessed November 15, 2018)

Sonbali, Chedsada and Suree Jaidee. 2014. “Klumwisahakijchomchon-sairainamjeud (kai) กลุ่มวิสาหกิจชุมชนสาหร่ายน้ำจืด (ไก) [Local Enterprise Groups (Kai)].” http://ctc.crru.ac.th/wp-content/uploads/2016/03/krumwisahakitchumchon.pdf (accessed November 22, 2018)

Tanakit, Pipat. 2013. “Kiankwamroo sangkwamsongjam: kandamrongyookongplabeuk teechiangkong เขียนความรู้ สร้างความทรงจำ: การดำรงอยู่ของปลาบึกที่เชียงของ [Recording Knowledge, Creating Memory: Conservation of Mekong Giant Catfish].” University of Phayao http://socanth.tu.ac.th/wp-content/uploads/2015/02/JSA-32-1-pipat.pdf (accessed November 20, 2018)

Team Group. 2019. “Saroobponkanprashumkwankidhenkongprashashon สรุปผลการประชุมรับฟังความคิดเห็นของประชาชน [Summary of Public Opinion Survey].” *Marine Department*. https://www.md.go.th/khet1/chiangrai/admin/images/upload/news/691-000.pdf (accessed May 7, 2019)

Teow, Penpichya. 2014. “Saraikai… muangnan kruangsamang riwroi สาหร่ายไก..เมืองน่าน เครื่องสำอางลดริ้วรอย [Kai Antiaging Cosmetic Products, Nan Province].” *Thairath*. https://www.thairath.co.th/content/436942 (accessed November 20, 2018)

Thai Channel 8. 2017. “Chaoreua Chiang Rai maihenduayraberdkork-eng maenamkong ชาวเรือ จ.เชียงราย ไม่เห็นด้วยระเบิดเกาะแก่งแม่น้ำโขง [Chiang Rai Boatmen Disagree with Explosion of Mekong’s

Islets].” https://www.thaich8.com/news_detail/26382(accessed November 20, 2018)

Thai PBS. 2016. “Keuancheenploinam… เขื่อนจีนปล่อยน้ำกระทบประมง-ร้านค้าริมโขง ระดับน้ำขึ้นลงผิดธรรมชาติ. [Chinese Dams Affected Aquaculture and Businesses…].” https://news.thaipbs.or.th/content/251086 (accessed November 20, 2018)

Thairath. 2017. “Deunna la 5 meunraicheu ddanraberdkengkong yeunnayok tonmati koromo เดินหน้าล่า 5 หมื่นรายชื่อ ต้านระเบิดแก่งน้ำโขง ยื่นนายกฯ ถอนมติ ครม [Chiang Khong People Actively against Mekong Rapid Explosion Project…].” https://www.thairath.co.th/news/local/852326 (accessed October 28, 2018)

_____. 2019. “Keuansaiyaburidernkreuang unitraek songfaikai kofopo samredttampao เขื่อนไซยะบุรีเดินเครื่องยูนิตแรก ส่งไฟขาย กฟผ. สำเร็จตามเป้า. [Xayaburi’s First Generator Unit Successfully Sold to EGAT].” https://www.thairath.co.th /news/business/market-business/1550186 (accessed April 23, 2019)

Thanyapon Buatong. 2018. “Samruad shippajon maenamkong สำรวจชีพจรแม่น้ำโขง [Observing the Mekong Vein].” https://www.bbc.com/thai/resources/idt-sh/mekong_blast_thai (accessed December 23, 2018)

Transborder News. 2017. “Shaochaingkhong kukkak ruamronnaron -gyai ddanraberdkengmaenamkong ชาวเชียงของคึกคักร่วมรณรงค์ใหญ่ต้านระเบิดแก่งแม่น้ำโขง [Chiang Khong People Actively against Mekong Rapid Explosion Project].” http://transbordernews.in.th/home/?p=15996 (accessed October 28, 2018)

Voice TV. 2018. “Plabuektihaipai – lomhaijairuairin kong pramong menamkong ปลาบึกที่หายไป-ลมหายใจรวยรินของประมงแม่น้ำโขง [Fate of

Mekong Giant Catfish].”https://voicetv.co.th/read/ rJRfIrUmQ (accessed November 19, 2018)

Baran, Eric and Mith Somountha. 2009. “Fish Biodiversity along the Mekong River from Himalaya to the Coast.” *World Fish Center*.

Baran, Eric and Chris Myschowoda. 2009. “Dams and Fisheries in the Mekong Basin.” *Aquatic Ecosystem Health & Management* 12(3): 227-234.

CK Power Public Co Ltd. n.d. “Xayaburi Power Company Limited.” ckpower.co.th

Cochrane, Liam. 2017. “China Wants to Dynamite the Mekong River to Increase Trade.” *ABC News*. https://www.abc.net.au/news/2017-05-15/china-wants-to-dynamite-the-mekong-river-to-increase-trade/8524008 (accessed December 10, 2018)

Foreign Policy. 2020. “Science Shows Chinese Dams Are Devestating the Mekong (by Brian Eyler). April 22, 2020. https://foreignpolicy.com/2020/04/22/science-shows-chinese-dams-devastating-mekong-river/ (accessed May 27, 2020)

Frake, Charles O. 1962. “Cultural Ecology and Ethnography.” *American Anthropologist* 64(1): 53-59.

Fu, Kaidao, Darning Ming He and Xi Xi Lu. 2008. “Sedimentation in the Manwan Reservoir in the Upper Mekong and its Downstream Impacts.” *Quaternary International* 186(1): 91-99.

International Rivers. 2014. “Understanding the Impacts of China's

Upper Mekong Dams." https://www.internationalrivers.org/resources/8477 (accessed December 10, 2018)

Kibler, Kelly M., Desirée D. Tullos, Bryan Tilt, Andreas Wolf, Darrin Magee, Eric Foster-Moore and Franz Gassert. 2012. "Integrative Dam Assessment Model (IDAM) Documentation: Users Guide to the IDAM Methodology and a Case Study from Southwestern China." Oregon State University.

Kuenzer, Claudia., Ian Campbell, Marthe Roch, Patrick Leinenkugel, Vo Quoc Tuan and Stefan Dech. 2013. "Understanding the Impact of Hydropower Developments in the Context of Upstream-downstream Relations in the Mekong River Basin." *Sustainability Science* 8: 565-584.

Kummu, Matti and Varis Olli. 2007. "Sediment-related Impacts due to Upstream Reservoir Trapping, the Lower Mekong River." *Geomorphology* 85(3-4): 275-293.

Lerer, Leonard B. and Thayer Scudder. 1999. "Health Impacts of Large Dams." *Environmental Impact Assessment Review* 19(2): 113-123.

Liebman, Alex. 2005. "Trickle-down Hegemony?: China's 'Peaceful Rise' and Dam Building on the Mekong." *Contemporary Southeast Asia* 27(2): 281-304.

Lu, Xi Xi and Ruyan Siew. 2006. "Water Discharge and Sediment Flux Changes over the Past Decades in the Lower Mekong River: Possible Impacts of the Chinese Dams." *Hydrology and Earth System Sciences Discussions* 10(2): 181-195.

Ministry of Foreign Affairs of Thailand. "The Visit of H.E. Mr. Wang Yi, State Councilor and Minister of Foreign Affairs of the

People's Republic of China, to Thailand." http://www.mfa.go.th/main/en/news3/6885/99840-The-Visit-of-H.E.-Mr.-Wang-Yi,-State-Councilor-and.html(accessed November 23, 2018)

National Statistical Office of Thailand. 2010. "Chiang Rai Census 2010." service.nso.go.th/nso/nsopublish/districtList/S010107/th/36.htm. (accessed December 7, 2018)

Power, Mary E. 1990. "Effects of Fish in River Food Webs." *Science* 250(4982): 811-814.

Ross, Kate. 2017. "Local Knowledge, Culture and Heritage: Collateral Damage of Mekong dams." https://www.internationalrivers.org/blogs/259/local-knowledge-culture-and-heritage-collateral-damage-of-mekong-dams (accessed May 11, 2020)

Sandford, Steve. 2018. "Chinese Initiatives Threaten Mekong River." *Voice of America. https://www.voanews.com/a/chinese-initiatives*-threaten-mekong-river/4578401.html (accessed November 30, 2018)

Shambaugh, David. 2015. "China's Soft-power Push: The Search for Respect." *Foreign Affairs 94*(4): 99-107.

Thailand Board of Investment. 2018. "A Guide to Investment in the Special Economic Development Zones (SEZ)." https://www.boi.go.th/upload/content/BOI-book%202015_20150818_95385.pdf (accessed October 28, 2018)

United Nations Development Program. 2015. "Human Development Data (1990-2015)." *Human Development Reports.*

Vandenbrink, Rachel. 2012. "Vietnam Joins Cambodia on Xayaburi Opposition." *Radio Free Asia.* https://www.rfa.org/english/

news/laos/xayaburi-07062012163933.html (accessed October 28, 2018)

Wang, Pu, James Lassoie, Shikui Dong, and Stephen J. Morreale. 2013. “A Framework for Social Impact Analysis of Large Dams: A Case Study of Cascading Dams on the Upper-Mekong River, China.” *Journal of Environmental Management* 117: 131- 140.

Winemiller, K. et al. (40 authors) 2016. Balancing Hydropower and Biodiversity in the Amazon, Congo, and Mekong. *Science* 351 (6269): 128-129.

Wong, Catherine. 2018. “Is This Cross-border River the New South China Sea for Disputes? (The title seems to have changed: Is Mekong River Set to Become The New South China Sea for Regional Disputes?).” *South China Morning Post*. https://www.scmp.com/news/china/diplomacy-defence/article/2126528/mekong-river-set-become-new-south-china-sea-regional (accessed October 28, 2018)

(2020.03.03. 투고, 2020.04.01. 심사, 2020.05.05. 게재확정)

<국문초록>

메콩강 상류의 댐 건설이 강 하류의 커뮤니티에 미친 영향: 태국 치앙라이의 사례

Silsupa Wiwatwicha & Edo Andriesse
(서울대)

본 연구는 강의 상류에서 일어나는 건설 행위가 하류 커뮤니티의 생계에 미친 영향에 대해 고찰한다. 특히, 태국 북부의 치앙라이 소재 세 개 군에 위치한 커뮤니티를 분석 대상으로 삼는다. 치앙라이는 라오스, 미얀마와 국경을 공유하고 있고 태국 내 지역으로는 메콩강 가장 상류에 위치한다. 여러 선행연구는 사회생태학적, 사회경제적 영향에 집중하였으나 본 연구는 태국어 문헌에 근거하여 사회문화적 측면도 강조한다. 사회경제적 영향은 대개 무형적(intangible)이지만 않지만 풍부하고 유서 깊은 전통을 가진 강둑 커뮤니티에게 중요하다. 상류의 개발에 대한 하류 커뮤니티의 인식은 지역문화, 믿음과 정체성의 소실에 대한 우려로 대표된다. 하지만 커뮤니티 생태계에 대한 이러한 위협은 한편으로 지역 시민사회 행동주의를 촉진하였고, 나아가 사회통합에 기여했다고 볼 수 있다. 생계와 커뮤니티에 미친 영향을 통해 우리는 흥미로운 역설을 발견한다. 변화하는 메콩 생태계는 경제학적인 측면에서는 사회분열처럼 보일지도 모른다. 하지만 사회문화적으로 접근하면, 개발사업 허가를 내리는 권위주의적 결정들에 저항할 역량을 키운다고 볼 수 있다. 연구의 이러한 분석 결과는 지역 거주민과의 소통 실패, 거시경제적 이익에 대한 집중,

미래의 생태계 변화에 대한 지역 커뮤니티와의 미비한 소통 수준 등으로 인한 정책 입안 과정의 문제점을 반영한다. 후속 연구에 대한 제언으로 본 연구는 마무리된다.

주제어: 치앙라이, 메콩 댐, 강둑 생계, 무형적 영향, 시민사회