

Project Report

# Fishing Livelihoods and Diversifications in the Mekong River Basin in the Context of the Pak Mun Dam, Thailand

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Received: 17 June 2020; Accepted: 3 September 2020; Published: 10 September 2020



**Abstract:** Fishing livelihoods are under stress in many regions of the world, including the lower Mekong river basin. Building on research on the socio-economic impacts of hydroelectric development, this paper explores the spatial dimensions of livelihood diversifications. Research in 2016 and 2017, involving 26 semi-structured interviews in nine upstream, downstream, tributary and relocated villages in the vicinity of the Pak Mun hydroelectric dam, provides insight into how villagers have coped and adapted fishing livelihoods over time. Results are consistent with other research that has detailed the adverse effects of hydroelectric development on fishing livelihoods. Interviewees in the nine communities in the Isan region of Thailand experienced declines in the abundance and diversity of fish valued as food, and engaged in other household economic activities to support their families, including rice farming, marketing of fishing assets and other innovations. Stories of youth leaving communities (rural-urban migration) in search of employment and education were also shared. Although exploratory, our work confronts theories that fishing is a livelihood practice of “last resort”. Narratives suggest that both fishing and diversification to other activities have been both necessary and a choice among villagers with the ultimate aim of offsetting the adverse impacts and associated insecurity created by the dam development.

**Keywords:** livelihood; diversifications; hydroelectric development; Pak Mun dam; Mekong river basin; traditional knowledge; local ecological knowledge

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## 1. Introduction

Fishing is the backbone of many cultures and economies in both marine and freshwater systems; one of the largest freshwater fishing systems in the world is the lower Mekong River Basin [1]. As in other regions of the world, fishing livelihoods are changing significantly as a result of stresses, including hydroelectric development [2]. In addition to changes to local and regional ecosystems (e.g., decreased water quality, alteration of water flow), the livelihoods of local fishers are under stress. Inspired by previous research on the socio-economic impacts of hydroelectric development in the lower Mekong [3–6], this paper explores how the livelihood practices of fishing communities in the Mun River region have changed in the context of the Pak Mun River Dam (PMD).

A review of previous research provided a foundation of insight concerning the socio-economic and ecological impacts (Table 1), the experience of which can vary significantly by location (e.g., downstream versus upstream). In this context, this paper explores the following question: how does the geographic location of those living in different locations in the vicinity of the dam affect fishing livelihoods and diversification towards other economic practices? Excerpts from interviews with villagers from four geographic areas (upstream, downstream, tributary and relocated communities) are offered around

three themes: pre-dam fishing, post-dam fishing, and other livelihood practices. A comparison of similarities and differences in these practices specific to each of the four areas of the study lead to a hypothesis concerning how the impacts of hydroelectric development vary by geographic location. Although preliminary, our work confirms the continued importance of fishing livelihoods in this area of the Mekong. Moreover, the work affirms the importance of recognizing that hydroelectric development impacts are not homogenous, and can vary by different ecological and socio-economic factors in different upstream, downstream and tributary areas, well as in communities affected by relocation. Those households and communities who are located in areas of greater ecological diversity have greater financial capital and other socio-cultural assets (e.g., social capital), and thus have greater opportunities for diversification.

## 2. Literature Review

Livelihoods are defined as “the capabilities, assets (stores, resources, claims and access) and activities required for a means of living” [7]. Early research on livelihoods dealt with circumstances of poverty and tended to frame communities as passive victims; more recent research has focused on the complex and dynamic kinds of livelihood strategies used by communities to survive and thrive [8].

Small-scale artisanal fishing, which is a multi-species, multi-gear activity, is recognized as an important contributor to local livelihoods and both social and ecological sustainability [9]. Small-scale fisheries are frequently characterized as the occupation of last resort, and fisherfolk as “the poorest of the poor” [10] (p. 377). This theory assumes that people fish because they have no other livelihood opportunities; however, there is little empirical evidence that “additional livelihood options actually result in a reduction in fishing” [11]. Conversely, it is not clear whether decisions about the pursuit of fishing are driven by economic necessity or by other socio-cultural norms and values. There are also questions about fishing only being the livelihood of the “poor”. Although poor in monetary terms, households in the lower Mekong area rich in terms of access to natural resources. “Policy-makers consider the current lack of large-scale hydro-development to be an underutilization of the Mekong’s resources. In reality, however, the Mekong’s resources are being extensively utilized on a smaller, more local scale” [4,12] (p. 82).

The viability of fishing as a livelihood strategy is, however, contingent on a variety of interrelated social and ecological factors, not the least of which is the availability of healthy fish stocks [9]. Social and demographic shifts associated with globalization (e.g., rural–urban migration) are key issues in many regions, including south-east Asia [13]. There is also growing literature on climate change and its impacts on fishing practices in freshwater ecosystems [14–16]. In freshwater ecosystems in the Mekong, Amazon and Mackenzie river basins, hydroelectric development has had dramatic impacts on fishing livelihoods (i.e., displacement, disrupted fish migration, decreased diversity, changes in fishing locations, safety, water quality, decrease water flow, changes in flood dynamics, increased flood hazards) [4,17–20]. Among the projects that have been significantly contested has been the Pak Mun Dam in Thailand [3]. Its effects on downstream, upstream and tributary regions have been documented over the last 20 years by academics as well as local villagers (i.e., Assembly of the Poor) [21,22] (Table 1).

**Table 1.** Themes from Previous Research on the Social impacts of the Pak Mun Dam.

<b>Displacement</b>	Many of the villages located near the location of the Pak Mun dam who derived their living from fishing were relocated by the Electrical Generating Authority of Thailand to villages 40 km from the dam location. “EGAT assured the fishing communities of 15 rai of agricultural land per family in lieu of the loss of their livelihood. Alternately, it assured 35,000 Baht per rai of land, totalling to 525,000 Baht. This became possible because the Assembly of the Poor protested and compelled the Electrical Generating Authority of Thailand (EGAT) for this in 1997” [23] (p. 25). The costs of resettlement originally estimated at BHT 231 million increased to over BHT 1000 million [23] (p. 24).
<b>Increased Food Insecurity</b>	The Pak Mun dam has undermined the abundance, productivity and diversity of Mekong fish resources. In villages already living with limited food resources, reduction in fish catch threatens local livelihoods and food security [3,4,12].
<b>Increased Cost of Living</b>	Impacts of hydro power on fishing, agricultural and other resources leads to increased cost of food resources and other livelihood assets. The cost of land also increased due to the purchase of land and compensation by the Electrical Generating Authority of Thailand (EGAT) [3]. (p. 64).
<b>Increased Social Conflict</b>	Lack of clear environmental assessment and poor consultation about the dam led to decades of protest and violence between government villagers opposed to the dam and concern about its impacts (1989–2007). Additional conflicts and tensions developed between villagers compensated and those not compensated for dam impacts as well as between anti- and pro-dam activists [3].
<b>Damages to Livelihood Assets</b>	Unexpected flooding events can wash away productive assets such as fishing boats and equipment [4].
<b>Impacts on Agricultural Activity</b>	Flooding can wash away crops and livestock [4]. Decreases in fishing activity and increased reliance on agriculture that includes fertilizers/pesticides can lead to nutrient and contaminant loading and compound declines in the health of the fishery (Interviews).
<b>Permanent Loss of Fishing Livelihoods</b>	Protests about lack of consultation and no compensation for losses to fishing livelihoods began in 1989 (led by local woman Charoen Gongsook) and grew over the next 10 years to include hunger strikes and mass protests in Bangkok [2]. A key concern was the timing of the dam openings/closures and the poor engineering of fish ladders. Although the 2005 government resolution to open the dam during the July–September period led to improvements in species migration and associated species diversity, many families are still unable to maintain fishing livelihoods [2].

People along the Mun River have long considered themselves fishing peoples; prior to the Pak Mun dam development, fishing was the main mode of nurturing their family and source of income [24]. Those fishing livelihoods were impacted in complex ways, not only by the construction of the dam and its environmental impacts, but also by the governance arrangements surrounding its construction and operation [3,6]. A critical question generated from the literature review about the impacts of the Pak Mun dam is how villagers impacted by the dam (including those in upstream, downstream, tributary areas and relocated villages) adapt their fishing practices in the context of the dam, or diversified their livelihoods away from fishing in order to support their families.

An important starting point in addressing this question of diversification is recognition that villages in this area of Thailand, like other communities, are not homogeneous [25]; people experience impacts in different ways depending on their knowledge and experience, culture, and socio-economic and political position, as well as age, gender and ethnicity. Moreover, we recognize that villages are not static but tend to innovate and diversify their livelihoods over time as a result of many kinds of endogenous and exogenous factors [26].

Much of the work on diversification emerges from the field of development studies, including that dealing with rural poverty, household economy and social relations [26]. Although our work focuses on fishing villages, we draw inspiration from other empirical work related to agriculture and income diversification in Africa [27].

There is much diversity in the literature about both the meaning as well as determinants of diversification. In economic terms, livelihood diversification is a means of offsetting or limiting the risk of specific or multiple stressors. In simple terms, people diversify their economies to create alternatives

in what, where, and how they secure their means of subsistence. Livelihood diversification can be also be considered a normative expression of security (e.g., food insecurity). It can also be defined quantitatively (e.g., how many strategies of generating income or subsistence does each household employ) [7,28].

Some scholars describe economic diversification as an intentional choice. In other cases, it is considered an involuntary response to crisis [29]. Disentangling these dynamics and drivers can be problematic. While intentionality or “choice” as an expression of agency can be measured in some circumstances, in other cases, the rationale and decision-making process is more obscure or ambiguous. Diversification, like other aspects of economic adaptation, can also occur over different time scales, while some kinds of changes in economic practice may seem to occur quickly in response to stress. Other kinds of diversification occur over longer time scales. This paper, which is based on qualitative data, approaches the issue of diversification more normatively.

Theories on diversification are also tied to those on adaptation, adaptive capacity and resilience [8]. These concepts have tended to account for both individual and household capacities and capabilities to change in social, economic and related practices (e.g., norms) so as to meet the needs of themselves, families and communities. Diversification may thus be viewed both positively and negatively. Scholars such as Ellis and others have been clear in suggesting that although there are many benefits of livelihood diversification (e.g., risk reduction), when imposed (made involuntary) and associated with unwanted stress, diversification may be valued negatively [26].

The longitudinal data about diversification are limited; panel studies in regions affected by hydroelectric development are critical in understanding individual- and household-level impacts, responses and choices, and how they vary over time. However, longitudinal research is difficult to develop and sustain. The “lack of comparable evidence across intervals of time means that it is rarely possible to state firmly whether household livelihoods are more diverse now than they were, say, ten or twenty years ago” [29] (p. 5). In the absence of longitudinal data, retrospective studies of a qualitative nature, based on local knowledge and oral histories, can help elucidate how livelihoods have diversified over time. It is on this assumption that this study developed, and therefore, it involves interviews with fishers about both historical and contemporary socioeconomic activities.

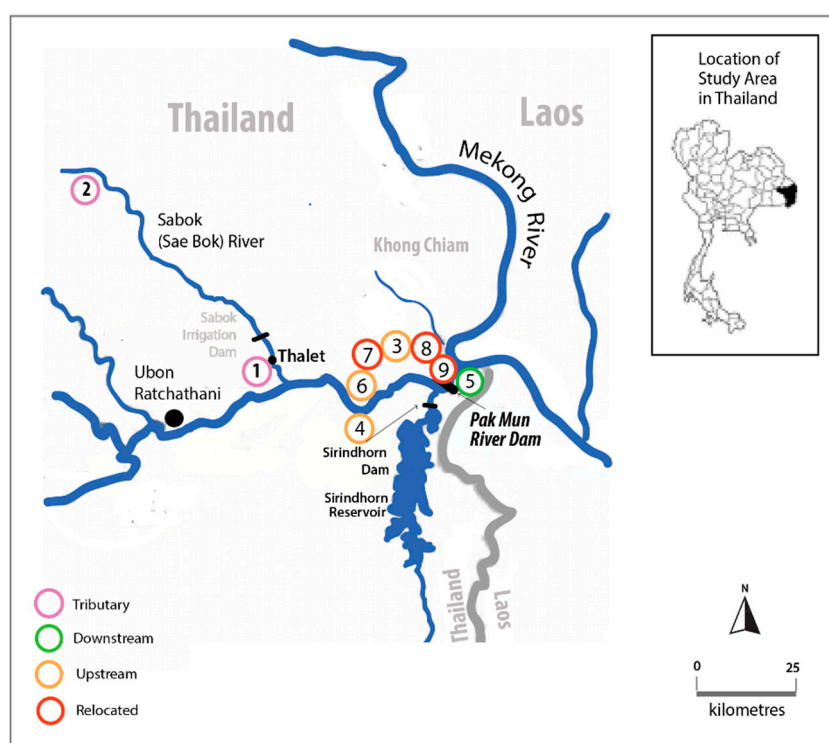
The spatial dimensions of diversification are also an important area of the literature. Early scholars in economics and geography, including those associated with the literature on environmental and geographic determinism, attempted to calculate and quantify the extent to which a diversity of resources in one geographic location contributed to a greater or lesser capacity for economic growth and self-sufficiency. Popular authors have attempted to simplistically define a linear relationship between resource conditions and economic outcomes [30]. For example, it is theorized that communities, regions or nations endowed with abundant and diverse natural capital (resources) have a comparative economic advantage over others with a greater potential for diversifying their economies. The resource curse literature, among others, has shown that natural capital is not the only determinant of growth or diversification, and that other socioeconomic and cultural factors mediate this relationship. Some studies, for example, have examined how different livelihood strategies (e.g., livestock production) vary at larger scales (e.g., regional ecosystems, nations) [31]. The relationship between livelihood diversification and geographic location is also understood to be multi-dimensional and dynamic; in addition to the ecological conditions shaping the kinds of livelihoods that are possible, people also shape these ecological conditions over time [32].

In the Pak Mun Dam context, an important point of contention was and continues to be the extent to which villagers depend on fishing for their livelihood [3]. Previous studies on livelihood, including state-led surveys, have been unable to quantify the specific degree of dependence, in part due to the informal nature of fishing economies (e.g., subsistence not market valued), the significant degree of ecological variability, as well as the politicalized nature of fishing in the Pak Mun region [3,4]. “Previous research suggests that fishing contributes significantly to livelihoods in the region and households supplement their income by off-farm labour, with significant rates of seasonal and long-term

out-migration, especially among younger people” [3,33] (p. 85). However, these livelihoods are not assumed to be uniform. Inspired by this previous research, we explore whether the geographic location of communities within the Mun and Sebok Rivers and their proximity to the Pak Mun Dam is a determinant of their contemporary livelihood strategies, including the extent to which they have diversified since the period prior to the construction of the dam.

### 3. Setting

The research took place in the lower Mekong Basin of Thailand in 2016 and 2017 (Figure 1). Interviewees were from villages upstream, downstream, and relocated away from the Mun River (Figure 2). The Mekong River system is large, spanning an estimated 4350 km, and running through China, Myanmar, Laos, Thailand, Cambodia and Vietnam [34]. The Mun river flows through northeastern Thailand, beginning in Nakhon Ratchasima Province and flowing 750 km to Ubon Ratchathani into the Mekong river [35]. The Mun River is home to rich aquatic resources and is the “main source of livelihood for villages located downstream” [35] (p. 3). As well as this, recent research from Baird et al. (2020) shows that those living upstream of the river also utilize its freshwater resources (Baan Thalath and Baan Doom Yai) [6]. The Mun River is also an important source of irrigation water for rice growing throughout the five provinces of Nakhon Ratchasima, Buriram, Surin, Sisaket and Ubon Ratchathani. According to Champoorsri et al. (2014), there are traces of prehistoric communities along the Mun, showing that the river has been vital to the livelihoods of riparian societies for over 3500 years [36].



**Figure 1.** Study Area—Ubon Ratchathani Province, Thailand, Mun River upstream and downstream of the Pak Mun River Dam, Ubon Ratchathani Province, Thailand. The map offers approximate locations of villages: (1) Baan Thalath, (2) Baan Doom Yai, (3) Baan Wangsabang Tai, (4) Baan Don Sumran, (5) Baan Huay Mak Tai, (6) Baan Kho Tai, (7) Baan Na Choom Chon, (8) Baan Hua Hew #11 and (9) Baan Hua Hew #4.

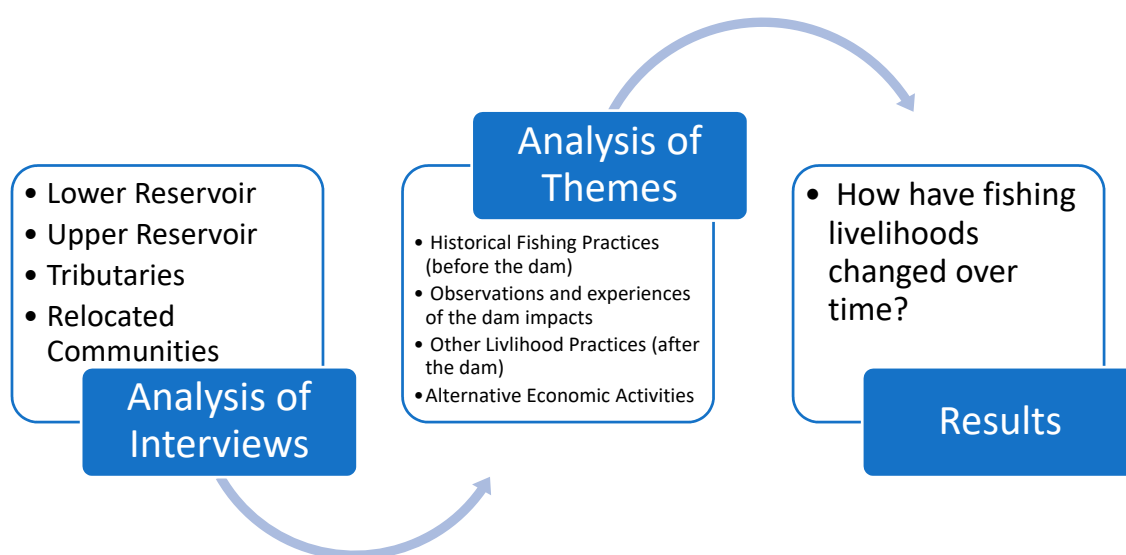


Figure 2. Organization of Results and Analysis.

The Pak Mun Dam is a run-of-the-river dam located in northeastern Thailand approximately 5.5 km upstream from its confluence with the Mekong in the province of Ubon Ratchathani on the Mun River [37] (p. 1). The dam was constructed between 1990 and 1994 and is 17 m high, 300 m wide and possesses eight radical gates that can be opened to release water [3]. The Electricity Generating Authority of Thailand (EGAT) built the dam with support from the World Bank. The dam was approved in 1989 and in operation by 1994 [3]. Prior to the opening of the PMD, villagers in the Mun River area mobilized to protest the environmental and social impacts of the dam. A movement called “The Assembly of the Poor” (AoP) emerged in opposition of the dam, creating an opportunity for local people to voice their concerns and share knowledge about their experience of these impacts (e.g., disappearance of some species downstream). However, regardless of these protests the Pak Mun Dam was commissioned and opened at an approximate cost of USD 260 million, but was criticized for major cost overruns. Although projected to produce USD 28 million in electricity annually, it is estimated the dam only produced USD 7 million per annum at the height of its operation, which was far from economically sustainable [37]. In other terms, it was estimated (in the year 2000) that the Pak Mun dam was losing BHT 2.3 million per day (or BHT 840 million per annum) [37].

Within the first year of operation, the Mun River had major impacts on fish migration and water levels, and greatly reduced the diversity of species in the river with consequent impacts on the livelihoods of local communities [3]. Although EGAT bowed to pressure to open the flood gates of the dam during part of the year and build a fish ladder, there are still major issues with the dam operation and its impacts on fish migration and fishing activity [38]. It is therefore not surprising that there has been significant opposition to this dam project from its inception and construction. Conflict between local villagers and EGAT erupted upon its approval in 1989 [37]. The initial goal of the dam was to generate electricity, however it is now known as a ‘run-of-the-river’ dam that provides irrigation to some villages. The dam was in operation by 1994, without a detailed environmental impact assessment during the construction process and limited consultation with villages affected by the dam. Since it has opened, the dam has affected the seasonal migrations of fish populations, river flow, river ecology and river bank ecology, food availability as documented by numerous scholars and community networks in the region, including the Assembly of the Poor, a local network of over 60 villages [21,22].

As a result of these issues of social, economic and environmental sustainability, scholars, villagers and others have strongly advocated that the “dam either needs to be decommissioned . . . or, at the very least, there need to be ensured that the gates of the Pak Mun dam are opened earlier in the rainy season when the most important upstream fish migrations occur” [38] (p. 150). Would this make a

difference? The dam's benefits as compared to the monetary losses to fishing livelihoods has been roughly calculated in previous research as 2:1. In other words, the dam produces a benefit of USD 50.6 million, however, it is estimated that decommissioning the dam and restoring river flows and fish migration would produce a USD 102.7 in subsistence and other values for impacted communities [39]. Understanding the impacts as well as the potential benefits of decommissioning the dam requires consideration of the complex and nuanced ways in which villagers experience dam impacts on their local livelihoods.

#### 4. Methods

Research on the impacts of the Pak Mun River dam has taken place over many years, led by local communities as well as global scholars. This case study research was one of a series of studies led by indigenous and local community partners with graduate students in the Mackenzie River Basin, and the Mekong and Amazon Rivers ([www.trackingchange.ca](http://www.trackingchange.ca)) [40]. Inspired by principles of Participatory Action Research [41], the methodological approach aimed to increase the voice of local villagers in describing the kinds of impacts experienced. Time and funding constraints as well as language barriers created constraints for in depth inquiry; the study approach and outcomes are thus presented as exploratory and not meant to be comprehensive. The researcher (lead author) made major attempts to understand the culture and language of the region prior to working in the region, including the completion of an intensive three-month Thai language course at the University of Madison–Wisconsin.

The study of fishing livelihoods is a rich area of inquiry with many different methods and tools developed and used in both marine and freshwater systems [42,43]. With the aim of learning more about this scholarship, a literature review was conducted to identify gaps and key issues. The review revealed some modest gaps in the understanding of variation in livelihood diversification. By interviewing villagers in a variety of locations (both upstream, downstream, tributaries, and in relocated communities), the researchers were able to explore geographic patterns in the kinds of household economic practices valued by villagers before and after the construction of the Pak Mun river dam. Given that no interviews were completed for this study prior to the dam, the results should be viewed cautiously. Semi-structured interviews were conducted in 2016 with villagers at various locations upstream and downstream of the Pak Mun dam. The majority of interviews were completed in the village of Ban Don Sumran and other upstream villages. In each of the other villages, 1–3 interviewees (local experts) willing to speak about the experiences of that village were identified based on recommendations of other scholars already working in the same villages. Subsequent interviews were identified through snowball sampling (e.g., interviewees recommending other interviewees). A total of 14 men and 12 women were interviewed ( $n = 26$ ). Given the small sample size from each of the villages, the work is far from comprehensive and should be viewed as exploratory and hypothesis-generating rather than conclusive. Additionally, although interviews were conducted in the tributary communities of Baan Thalot and Baan Doom Yai, data are sparse due to the limited number of interviews.

Semi-directed interview methods were used to ensure a balance between the research needs of the project and the expertise and interests of interviewees (Table 2). The researcher encouraged interviewees to communicate about issues of critical importance to them with the aim of evidencing the scope and dynamics of livelihood practices in each village. Additional interviews with the same individual or a larger sample size would have increased the depth of understanding of the complexity of these individual and family experiences, but were not possible due to the limited study timeframe and resources.

**Table 2.** Study areas and number of interviews.

Upstream	Downstream	Tributary	Relocated
Baan Don Sumran (13)			Baan Hua Hew #4 (1)
Baan Kho Tai (3)	Baan Huay Mak Tai (2)	Baan Thalat (1)	Baan Hua Hew #11 (1)
Baan WangsabangTai (3)		Baan Toom Yai (1)	Baan Na Choom Chon (1)

The age range of interviewees was commonly 45–65 years, however the total range is 18–77 years. There were specifically three other community members who spoke to the researcher but declined to participate in a recorded interview, as well as other community members who the researcher spoke with briefly during the homestay in Baan Don Sumran. While not included in the data, those community members were still helpful in guiding the researcher to those who would consent to an interview. An interpreter/translator with knowledge of the research themes was employed as all interviews were conducted in the local Lao/Isan dialect. All interviewees provided oral consent to participate in the project and to be interviewed according to the terms of the University of Alberta Ethics Approval (Pro00066279).

Audio recordings and written notes were transcribed by the lead author. A thematic analysis was subsequently undertaken with major themes and sub-themes being identified [44,45]. More specifically, responses to each question were coded and then patterns were identified in responses with the aim of learning more about differences and similarities in each of the villages (Figure 1). The results were initially categorized into 29 themes related to livelihood practices, and these themes were then consolidated into the four themes presented in the results section: (i) historical fishing livelihoods prior to the dam; (ii) observations and experiences of dam impacts; (iii) contemporary fishing livelihoods and (iv) alternative economic activities. The thematic analysis was also conducted with a temporal lens to better understand the degree to which livelihoods had changed from historic periods (prior to the construction of the dam) and after the dam. A spatial analysis was subsequently undertaken to compare how diversifications varied geographically. Specifically, the four categories of geographic location (upstream, downstream, tributary and relocated) illustrate the varied and diverse ways in which hydroelectric development can impact the livelihoods of fishing peoples.

## 5. Results

The results are presented around four themes: (i) historical fishing livelihoods prior to the dam; (ii) observations and experiences of dam impacts; (iii) contemporary fishing livelihoods and (iv) alternative economic activities. To better understand the geographic differences in these themes, the data are presented by geographic location, including upper reservoir, lower reservoir and relocated communities.

### 5.1. Upstream Villages

A total of 16 interviews were conducted in the villages of Baan Don Sumran, Baan Kho Tai and Baan Wangsabang Tai located upstream from the Pak Mun (Figure 2). Most of the interviews for the upstream area took place in the village of Baan Don Sumran due to the researcher participating in a 10-day homestay in that particular community.

#### 5.1.1. Historically Significant Local Fishing Practices

Fishing is an important practice in this area. For example, Wittaya Thongnoi from Baan Don Sumran explains, “I wanted to be a fisher because I saw it as part of the livelihood of Don Sumran”, (3 December 2016). The lower reservoir was home to many people in the older generation (aged 50+) who remember when fishing was a regular day-to-day activity that everyone in the community participated in. Nearly everyone interviewed spoke about learning to fish from a young age. Por Charlie Wae Wong, also from Baan Don Sumran, stated, “my parents and grandparents taught me how to fish, I learned by watching and following them to the river”, (Baan Don Sumran, December 2016). People worked together and sometimes fished together. For example, it was not uncommon for



people to share gear, as explained by Wittaya that “different families would share boats, three or four different families would all go out on one boat to fish together”, (Baan Don Sumran, 3 December 2016).

During previous periods when the fish were more plentiful, food sharing was common. Three interviewees mentioned that prior to the construction of the dam, food sharing was a common practice. For example, Mae Mii Santaweesoong explained that “in the past, there were lots of fish and a big catch. Our relatives would ask for fish and we would give to them for free. Now, people don’t ask for fish because people don’t catch that many fish”, (Baan Don Sumran, 2016). It is important to note that many people in this area are renters. Mae Mii Santaweesoong and Por “Charlie” Wae Wong are examples of people in Baan Don Sumran who are land renters and still rely on fishing as their main source of income.

### 5.1.2. Impacts on Local Landscapes from the Dam

The landscape characteristics of this region have shaped how and where people fish in this area of the Mun River. An embankment prevents people from wading into the river from the riverbank. Local people used to wade into the river and set up nets or traps for the fish, sometimes even standing in the water and holding the nets themselves. They used to help each other trap fish. But since the construction of the dam, people have been unable to wade into the river because of changes to the embankment of the river. The river becomes deep almost immediately, and it is unsafe to be standing too deep in the river; therefore, wading areas are almost nonexistent. Interviewees also expressed concern that they no longer allow their children to be close to the river because it is now too deep for them to play safely. This contributes to less transmission of traditional knowledge to the younger generation.

Another major impact on the landscape is the loss of the rapids. Specifically, the rapids known as “Hin Nak,” “Hin Soon” and “Hin Len” have disappeared from this area:

“The rapids ‘Hin Nak,’ ‘Hin Soon,’ and ‘Hin Len’ were important rapids because we could go there and get our food immediately. It was quick and easy to get fish. Now the rapids are submerged. Today instead of the sounds of the rapids, we only hear the sound of the mobile market. My husband used to say, ‘cook the rice, boil the water and I’ll be back in a few minutes with the fish.’ It was that easy” (Pratim Kamparat, Baan Wangsabang Tai, 11 December 2016).

During the construction of the Pak Mun, these rapids were blasted out of the water, and when the dam is closed, the water is too high for the rapids to appear. Rapids are an important area for catching fish, and therefore, the loss of the rapids has meant that people can no longer get fish there.

### 5.1.3. Current Fishing Practices

The dam creates different kinds of challenges for fishers, but there are a variety of adaptations and innovations in fishing gear that have been developed by fishers in the downstream area. While some gear is purchased, much is homemade or fashioned out of different materials that are recycled or reused. For example, Mae Mii Santaweesoong, from Baan Don Sumran, created a shrimp trap out of plastic soda bottles. Her invention has made her fish trap more effective in the stagnant water of the Mun during months when the dam is closed. “We have to adapt, and it has been difficult because sometimes we cannot catch fish at all” (Mae Mii Santaweesoong, Baan Don Sumran, 12 December 2016).

Other fishers in the community commission Mae Mii to make traps. However, she expressed some reluctance to teach others how to create the traps because she generates income from their production and sale. In addition to these practices, other kinds of fishing activities have developed that seem to offset losses in wild fish. For example, many villagers in Baan Don Sumran make use of personal fishponds on their property in order to raise fish for either income or sustenance. Many different kinds of fish are raised. One of the interviewees, Somchit Phathong, explained that her pond is not common in the village because she raises “Climbing Perch” or Pla Mor (Thai) instead of Tilapia. The fishpond gives her a side income as well as something to do. At the time of her interview in November 2016, she had owned the fishpond for only four months and had already sold around 40–50 kgs of fish. She does this

through word-of-mouth and asking around the village if anyone is interested in purchasing Pla Mor. When someone is interested in purchasing fish, she pumps the water out from her pond and picks out the largest ones for the customer. Somchit also owns a rice paddy which serves as an additional source of income for her household. She explains, “I eat fish from my fishpond and rice from my rice fields”, (3 December 2016). Further to this, she states that fish farming is a family activity: “the fishpond is a family activity, and they help me with it. My son used the tractor to make the pond, and my daughters help sell the fish” (Baan Don Sumran, 2016).

Although people work and support one another when needed, there is some competitiveness, and a perception that this support has changed from previous years. According to some fishers interviewed, there is some reluctance in sharing knowledge, food and livelihood practices because this may impact the success of individual households. Por Setun Kongkaew from Baan Wangsabang Tai explains that “people can borrow fishing gear, but others don’t really like lending out their fishing gear because it can get broken easily” (11 December 2016).

Consequently, a new opportunity that has appeared in this area since the implementation of the Pak Mun Dam is fiberglass boatmaking. Baan Don Sumran is the only interviewed village wherein people are actively engaged in fiberglass boatmaking. Local people in this village have the opportunity to participate in a program at the Tessaban (Municipal Government) that teaches them how to make fiberglass boats. This program is open to those in other villages, however it was not seen in any of the other interviewed villages. Por Tanom Tongnoi (Baan Don Sumran) is one of the interviewees who participated in the fiberglass program, and states that “fiberglass boats are light and fast. They are made because the Shorea trees have been used for boats and houses and there is not many left” (3 December 2016). The program seems to have been well-received by Baan Don Sumran villagers. Por Paliwat Pinthong stated that “programs like the fiberglass fishing program are good because they allow people to make boats and make a bit of money”, (Baan Don Sumran, 2016).

As explained by Somchit Phathong, “the Tessaban does have a program for raising Tilapia”, as well (Baan Don Sumran, 2016); it helps people learn how to raise fish in their own personal fishponds. Some local people already have rice paddies where they can raise fish and utilize this program to learn efficiency and proper fish cultivation. Diversifying their livelihoods through tilapia cultivation also helps to ensure villagers have a source of protein.

Por Charlie Wae Wong also diversified his fishing livelihood by becoming a fish trader. For the past eight years, he has been a liaison between fishers in the area and exotic fish purchasers. In order to facilitate this interesting diversification, he states “I ‘invented’ the ‘baht’ fishing method, using the net for fishing in the twigs. You don’t have to use bait because tiger fish like to be in dark places with lots of plants”, (Baan Don Sumran, 2016). It is important to note, however, that not all villagers in this area of the Mun River have access to a rice paddy or fishpond.

#### 5.1.4. Alternative Economic Activities

The fishers interviewed in this area also talked about other kinds of activities besides fishing. Por Saman Tongnoi from Baan Don Sumran explains, “I used traditional farming in the past. Now I have a tractor and don’t have to do it by hand. My wife and eldest son help me. The old technique involved my wife gathering and sowing seeds”, (Baan Don Sumran, 3 December 2016). Prior to this mechanization, villagers were plowing their rice paddies using water buffalos, a tiresome and grueling process.

A common practice in Baan Wangsabang Tai is that of broom-making. All of the three interviewees mentioned that this village is known for its brooms. Pratim Kamparat explained that broom-making arose due to villagers being unable to fish: “We were affected. We cannot find fish, so we started making brooms” (11 December 2016). Pratim used to be a fisherwoman and still fishes when the dam gates are open once a year. She primarily uses gill nets during this time of year. “The way people are fishing has changed. Now there is too much water to use small nets. You can really only use gill nets in flowing water, or when the dam is open”—Pratim Kamparat (Baan Wangsabang

Tai, 11 December 2016). According to her, it is more reliable than attempting to catch from the Mun. Por Petch Najaan from the same community agrees; “most people in this village raise fish, raise crickets, make brooms, baskets, and farm rice”, (Baan Wangsabang Tai, 2016).

## 5.2. Downstream Villages

The downstream village (Baan Huay Mak Tai) involved in the study is located downstream of the dam near the confluence of the Mekong and the Mun Rivers near Baan Khong Chiam. Two women from the village of Baan Huay Mak Tai, Mae Tussanee Chiangam and Mae Ora Boontun, gave their accounts of life after the Pak Mun Dam. Baan Huay Mak Tai is located near the embankment of the Mun River. This village is so near to the confluence that the border with Laos can be seen in the distance.

### 5.2.1. Historically Significant Local Fishing Practices

This region of the Mun River has historically been a focus of moderate fishing with limited opportunities for rice farming. Mae Ora Boontun from Baan Huay Mak Tai explains that “this area is rocky, so only a few people had rice farms”, (2016). Fishing was the main source of income for the area, and therefore, as noted by Mae Tussanee Chiangam, trade for rice and other resources was prevalent. “When my Grandpa was fishing, he fished. He didn’t have to sell the fish, he just traded and brought the rice home”, (Mae Tussanee Chiangam, Baan Huay Mak Tai, 2016). Mae Tussanee Chiangam also mentioned, “I have been fishing all my life”, similar to many people in Baan Huay Mak Tai, who have been fishing from a young age.

### 5.2.2. Impacts of the Dam on the Local Landscape

The construction of the dam created areas known locally as “the area in front of” the dam and “the area behind the dam”. Baan Huay Mak Tai is in a somewhat middle position, wherein local people do not necessarily know which area is best for them to fish. Many people gather directly in front of the dam to catch fish migrating from the Mekong. Locals from Baan Huay Mak Tai often fish there; however, because of the large number of people “camping” in that area, sometimes it is difficult to find spots to fish or set up fishing lines. As Mae Tussanee Chiangam explains “there are no ‘rules’ but we are considerate about where others fish. [Where] people already have nets set up and there is no room for us”, (12 December 2016).

Mae Tussanee Chiangam said she only fishes nearer the Mekong River, behind the dam. This is the easiest place for her to catch the few fish that have been able to migrate up the fish ladder. Prior to the dam, she used to fish closer to the confluence, but the dam prevents her from moving closer to that area. In order to travel closer to the Mekong, she would need to bring her boat out of the water and drive it to the other side of the dam. She does not own a vehicle and does not have the expendable income to hire someone to move her boat. The dam has stopped her and other local people in similar situations from being able to travel along the river and catch fish.

### 5.2.3. Current Fishing Practices

Similar to the other villages in this study, less people from Baan Huay Mak Tai are fishing in general. Those who do fish have had to make changes to their fishing practices. One of the major changes in this village relates to sharing fish; people no longer share fish amongst each other unless they have had a particularly good catch. This may be because wild-caught fish generate more income and therefore people prefer to sell them. The Mekong River fish are described as “more delicious” and are therefore more expensive.

Since this area is so close to the Mekong River, people are able to fish both “in front” of and “behind” the dam if they have transportation to move their boats. This may help to catch more wild fish, but it is more practical for households not to share fish with each other and sell the wild-caught fish instead. It is also less likely for people to share fishing gear due to the fact that they usually need to purchase it from the market and are fearful of it being damaged. People do still share locations for

fishing, but often the good places for catching fish are taken in the early morning. There are also a lot of fishing traps in a smaller area, making it harder for people to catch fish.

Fish trade is also impacted in this area. Less wild-caught fish means that locals of Baan Huay Mak Tai do not have as many fish to trade for rice with other villages. As well as this, people from other villages who own rice paddies are choosing to raise fish, such as Tilapia, themselves, and are no longer in need of wild-caught fish as their daily source of protein. Rather than trade, those from Baan Huay Mak Tai often need to purchase their rice, or work harvesting other people's fields in exchange for rice. Mae Tussanee Chiangam notes "when my Grandpa was fishing, he fished. He didn't have to sell the fish, he just traded and brought the rice home", (12 December 2016).

#### 5.2.4. Alternative Economic Activities

Those who are unable to fish consistently must pick up laboring jobs to make money. "Our main source of income comes from fish and laboring", (Mae Tussanee Chiangam, Baan Huay Mak Tai, 2016). Again, as mentioned by Mae Ora Boontun, "this area is very rocky, so only a few people have rice farms", (2016). Additionally, many locals in Baan Huay Mak Tai, including those interviewed, had to incur debt to sustain their households. Although they received compensation for loss of fisheries during the construction of the dam, the amount was not enough to sustain people through permanent loss of fishing livelihoods.

### 5.3. Tributary Villages

Similar to the other three geographical areas, local fishing practices play a large role in the livelihoods of upstream people. The major difference in this region is that the Sebok is a tributary of the Mun, meaning that fish must travel farther in order to reach these villages.

The Sebok is an important geographical location because it illustrates that those who are not as closely situated to the dam are also impacted. Those living in Baan Thalath and Baan Doom Yai have not been compensated because there has been a lack of research and literature on the impact of the Pak Mun Dam on upstream communities. It would seem as though these villages are often forgotten, and the impacts of the Pak Mun in this area are not taken as seriously. There has been much literature written and research done on villages in the lower reservoir and along the Mun; however, because Baan Thalath and Baan Doom Yai are not in close proximity to the dam, little research has been done on their behalf. The idea that the Pak Mun has impacted local people in this area has barely been acknowledged, and those living on the Sebok have not received much consideration. The inclusion of the Sebok River and its people in this project is important in contributing to a newer literature and research on upstream impacts. As well as this, those of the Sebok have the right to a voice in terms of their livelihood [6].

#### 5.3.1. Historically Significant Local Fishing Practices

This project does not offer a large amount of data on the historically significant fishing practices of the Sebok river due to having only spent a small amount of time in Baan Thalath and Baan Doom Yai.

#### 5.3.2. Changes that Occurred as a Result of the Pak Mun Dam

This project does not offer significant amounts of data on how the PMD has affected the Sebok communities. However, the aim of the Baird et al. [6] research is to document fish catch data for three villages, including Baan Thalath and Baan Doom Yai. More data about the Sebok are, however, included below.

#### 5.3.3. Current Fishing Practices

It seems as though while people are still sharing boats, there is less sharing of gear, such as nets. Suphan Chansawang from Baan Thalath mentions that utilizing store-bought gear makes it easier to

catch fish; “We used to use cloth nets, but now we use ‘Mong Eng’ (Nylon) because the fish cannot see nylon”, (2016). However, because people want to keep their nets in working condition, they might be less likely to share them. “We share boats, but not nets because nets are delicate. If you are careful with your net it can last up to 3 years”, (Weera Surirach, Baan Doom Yai, 2016).

Two interviewees mentioned less cooking of traditional foods. Weera Surirach from Baan Doom Yai explaining that “before the dam, we used to eat raw fish, but now we cook them. We no longer make Goy Paa”, and Suphan Chansawang from Baan Doom Yai stating “I sell more fish than I cook”, (2016). There is a chance that in the future few people will know how to cook Goy Plaa, because lack of use can lead to lack of transmission of the recipe.

#### 5.3.4. Alternative Economic Activities

Interviewees in the Sebok area are cultivating rice; however, Weera Surirach from Baan Doom Yai was the only interviewee to mention utilizing fertilizers and other chemicals to get a better crop yield. He states that “the fish that are raised in rice fields are raised with chemicals, fertilizers and pesticides”, as well as the following:

“Some government officials say that we should use less fertilizer, however the people know they will get more product if they use it. The government also warns about live diseases from eating too many toxins in the fish or getting too many toxins from the water. They have health promotions (advisories) that inform the people about fish parasites” (Weera Surirach (Baan Doom Yai, 19 November 2016).

#### 5.4. Relocated Communities

Other interviewees were from relocated communities. These are communities who were in the immediate area of flooding and were required to move to new locations to avoid flood risks. Most interviewees expressed that they were reluctant to relocate during the construction of the dam. However, the flood risk from the dam meant that their villages would be submerged, and the embankment would make the riverside deep and inaccessible for growing plants. Therefore, local people had no choice but to relocate.

##### 5.4.1. Historically Significant Local Fishing Practices

Prior to being relocated, the historical way of life for Baan Na Choom Chon, Baan Hua Hew #4, and Baan Hua Hew #11 was centered on fishing livelihoods. Most people fished and knew how to fish, as their parents passed the knowledge down to them. Knowledge and skills for fishing were second-nature, as explained by Por Jumrut Sanorwatee from Baan Na Choom Chon—“even 6-year-old kids can fish. Young kids would go with nets and fishing rods”, (2016). The riverbed was an important area used for fishing. “People used to grow plants along the river that could make rope for fishing nets, people didn’t have to buy fishing gear because they could make it out of Hemp or Thuringia”, (Mae Charoen Gongsuk, Baan Hua Hew #11, 2016).

##### 5.4.2. Changes that Occurred as a Result of the Dam

Residents of Baan Hua Hew #4, Baan Hua Hew #11 and Baan Na Choom Chon were forced to relocate. Most of the old village areas were flooded when Pak Mun opened. Mae Charoen Gongsuk explaining that during the relocation process it was explained to her that her “rice farm was close to the river and it would be flooded and affect all living things on the riverbank”, (Baan Hua Hew #11).

Those who were forced to move used their compensation to cover the cost of moving and rebuilding. Therefore, the compensation provided was not beneficial to any of the villagers because it was utilized during the relocation process and there was nothing left for after resettlement. Por Junrut Sanorwatee from Baan Na Choom Con explained that “we only got enough compensation to move our belongings”, (13 December 2016). The family had to incur the cost of rebuilding their home themselves. According to him, not every household received the same amount of compensation or at the same

time. Some households had no other choice but to move at their own expense, acquiring more debt, with little money to support their families.

Mae Charoen Gongsuk from Baan Hua Hew #11 stated that EGAT and the government hosted community meetings prior to the dam's construction to educate people on the project and gather the opinions of local peoples. The project was purported to be advantageous for local people and for development in Thailand. However, there was no mention of the disadvantages of the project, and when asked, representatives dismissed misgivings as being detrimental to development. Mae Charoen Gongsuk explains that government officials were sent to her house after the meeting in the hopes of convincing her of the dam's advantages, and when she did not agree with them they threatened her: "I said 'if you want us to speak up why are you trying to scare us?'" (Baan Hua Hew #11, 13 December 2016).

#### 5.4.3. Current Fishing Practices

Current fishing practices in these villages seem almost nonexistent, as people live so far from the river that there is less opportunity for adults to take their children to learn. The younger generation is no longer being taught to fish because fishing is less utilized in this area as a primary source of income. Due to the lack of use and necessity, the transmission of traditional knowledge about fishing livelihoods is dying in these areas. Por Junrut Sanorwatee explains that "some people still fish, but now we are very far from the river! Our livelihood is not the same. We live so far from the Mun there is no point in teaching our children to fish" (Baan Na Choom Chon, 2016). He also explains that the transmission of traditional knowledge also extends to practices such as gear-making: "last year I only made one net. Today people don't learn about the things that our grandparents taught us, there is no learning", (13 December 2016).

#### 5.4.4. Alternative Economic Activities

Interestingly, during the course of interviews one villager had actually worked to construct the Pak Mun Dam. Boonluan Mingboon (Baan Hua Hew #4) explained that he took the job at Pak Mun because laboring is a way that people generate more income for their households. During construction periods, dams require many unskilled workers and new jobs are generated during this phase of development (World Commission on Dams, 2000). However, he also explained that he feels guilt for laboring on a project that brought many negative impacts to his community, including forced relocation: "The dam affects me a lot because I built it. I did not support the dam, but I needed the money, so I had to just do it", (13 December 2016).

Understandably, community members must take on extra labor jobs to generate income. Those who have been resettled have lost their proximity to the river and their farms, and are forced to labor to pay for the debt they have incurred from a loss of livelihood. Although EGAT and the government offered them compensation, it was gone almost immediately after being used to resettle, and many people went into debt in order to sustain their households. Taking on a job at the Pak Mun site may have been the most convenient option for people at the time. Extra laboring is a type of livelihood diversification that is necessary, especially for relocated communities.

#### 5.5. Common Diversifications both Upstream and Downstream

There are some examples of similar fishing diversifications that are being employed by communities from multiple geographic locations. Those who are still fishing daily seem to have a preference for selling fish instead of eating or sharing it. A total of eight interviewees expressed this preference. Suphan Chansawang from Baan Thalat stated "I sell more fish than I cook", and Por Seetun Kongkaew from Baan Wangsabang Tai explained that "we catch fish and make money, especially from tiger fish", (2016). Five interviewees spoke about fish stocking. Boonluan Mingboon, for example, stated "I want the government to release more fish and prawns", (Baan Hua Hew #4). In addition to selling fish, two interviewees mentioned that they purchase more store-bought fish than in the past. Pim Davong

from Baan Kho Tai explained that “people today buy ready-made fish from the market. The days of fish cooking are done”, (2016).

There was a common reflection that while fishing is important, the development of alternatives and complimentary livelihood practices is needed “We can’t rely on fish anymore. We have rice fields, cassava and rubber plantations. Fish in the fishing season, rice in the rice season and construction in any other season”, (Boonluan Mingboon, Baan Hua Hew #4, 2016).

“People like to fish, but they also have other things to do. If the fish come from the Mekong they taste better. The flesh is softer because the river is flowing, and the fish get more exercise and the taste is delicious. Fish in the Mun are bland because the water is stagnant. Most people in this village fish, raise crickets, make brooms, baskets and farm rice” (Por Setun Kongkaew, Baan Wangsabang Tai, 2016).

The above quotes also demonstrate that local people take part in other types of farming when not growing rice. Por Saman Thongnoi explains “I plant eucalyptus, mango trees, woods and rice. Now I have a tractor and don’t have to do it by hand”, referring to the additional diversification of utilizing mechanized farming equipment instead of cattle (Baan Don Sumran, 2016). Weera Sururach from Baan Doom Yai also stated that people are utilizing fertilizer in their farming and “some government officials say they should use less fertilizer; however, the people know they will get more product if they use it”, (2016).

As well as growing other crops, some interviewees stated that they also sell food as a means of income. Mae Mii Sam Dii from Baan Don Sumran, who owns a mobile market, stated “almost all the fish I sell is aquaculture fish. I come to villages everyday and people buy meat and vegetables”, (2016).

Three different interviewees commented on the mobile market itself as another diversification, whereby local people no longer need to go to the market to get their food, although it appears that the existence of the mobile market is deemed as a loss of local way of life for some interviewees:

“In the morning there is a mobile market and people buy eggs. Today people don’t learn about the things that our grandparents taught us, there is no learning. I am worried about the future because they do not know any fundamental knowledge about learning”, (Por Jumrut Sanorwatee, Baan Na Choom Chon, 2016).

“The rapids ‘Hin Nak’, ‘Hin Soon’ and Hin Len’ were important rapids because we could go there and get our food immediately. It was quick and easy to get fish. Now the rapids are submerged. Today instead of the sounds of the rapids, we only hear the sound of the mobile market. My husband used to say ‘cook the rice, boil the water and I’ll be back in a few minutes with the fish’. It was that easy”, (Pratim Kamparat, Baan Wangsabang Tai, 2016).

The previous quote from Boonluan Mingboon from Baan Hua Hew #4 also mentions construction work as a diversification. Four interviewees mentioned taking on laboring jobs as an additional source of income. Mae Tussanee from Baan Huay Mak Tai states, “our main source of income here comes from fishing and laboring”, (2016), and Mae Mii Santaweesoong from Baan Don Sumran explains “people hire me to cut cassava”, (2016). Therefore, laboring is a diversification employed by multiple communities.

Working in different cities, or rural-to-urban migration, is another more commonly mentioned theme, whereby nine interviewees explained that people often leave the communities to work in urban cities such as Bangkok and Chon Buri. For example, Por Saman Thongnoi states “We don’t see the teenagers because they study in different cities and they work in different cities, once you are done school you can work in the factory”, (Baan Don Sumran, 2016).

Another example is mentioned below:

“I lost my family and our living condition, because we don’t make enough. Money is an important factor. We don’t get enough money from fish catch and we don’t even make the lowest estimated (household) income in Thailand (supposedly 100 K Baht/year)”, (Mae Tussanee Chiangam, Baan Huay Mak Tai, 2016).

Changes in food sharing were also noted in all but one of the villages. Interviewees expressed their concern that because there are less fish, people are fishing less and there is a lack of sharing

now as compared to the past. An associated loss of knowledge sharing was also noted. For example, Boonluan Mingboon states “if I don’t have more children my knowledge might disappear. I knew my knowledge of fishing my entire life, I would be sad to lose it. But we have a different way of life now”, (Boonluan Mingboon, Baan Hua Hew #4, 2016). Additionally, Por Tanom Thongnoi from Baan Don Sumran explains:

“Yes, I am worried about the loss of culture because as a father, if I cannot catch that many fish, I don’t feel confident to teach my children to fish. It cannot be their career. I feel bad that culture is being lost. When my dad taught me there were lots of fish, now the wisdom is lost”, (2016).

#### 5.6. Broader Drivers of Change

Although the dam has had a significant impact on the livelihoods of villages upstream and downstream, there are other social, economic and cultural drivers of noted concern and interest for villagers interviewed. The most common issues discussed by villagers across all nine communities were less sharing of fishers’ knowledge, rural-to-urban migration, rice farming, education and laboring.

Some of the older interviewees also mentioned that while their children may have migrated to urban centers, they sent their grandchildren back to the communities. Por Saman Thongnoi explains “we have a nephew that was sent back to live with us at six months”, (Baan Don Sumran, 2016). In turn, the practice of sending money back to parents in the communities for grandchildren and other necessities is also mentioned by interviews. Mae Mii Santaweesoong states “children support their parents financially now”, (Baan Don Sumran, 2016). A push for education was mentioned by seven interviewees, whereby there was an emphasis on doing well in school in order to have a better life and potentially look after your older parents. “Education brings a lot of changes. Today, young people move to larger cities and older people look after the grandchildren. The kids send money back to their parents for their grandchildren”, (Por Saman Thongnoi, Baan Don Sumran, 2016). It was also mentioned by one interviewee, Mae Mii Santaweesoong, that perhaps education should take precedence over fishing: “Children can learn to fish in their free time but studying is more important”, (Baan Don Sumran, 2016).

## 6. Discussions and Conclusions

Dams in freshwater systems can create myriad risks and insecurities for local communities, ranging from displacement and loss of access to livelihood resources (e.g., fish species valued for subsistence and market sale). Where dams are poorly planned and constructed, there are also risks to human life due to accidents and infrastructure collapse. It is important to note that in 2018, following the completion of fieldwork in the region, the catastrophic collapse of the Saddle D dam in nearby Laos led to the tragic deaths of over 100 people and the displacement of over 1000 people [46].

In this case and others around the world, it is often those who have limited livelihood options who are the most affected by dam construction and its failures. This study adds to the existing body of work in its exploration of how hydro impacts vary by geographic location. The results, based on 26 interviews in nine villages, demonstrate the continued importance of fishing in this region, as well as the ways in which villagers have coped and adapted their fishing practices, and engaged in other kinds of practices in order to support their families and communities in the context of this hydro-electric development project. The results also show that multiple livelihood diversifications are being employed at once by local people, and that when one practice, such as fishing, becomes more difficult, other practices, such as rice farming, will become the more widespread alternative economic activity. As noted elsewhere in the literature, the voices of the villagers highlight how diversification has been both a necessity and a choice with the ultimate aim of increasing livelihood security.

The outcomes of the research are similar to those of other studies that conclude that fishing in the Mekong region is a significant contributor to the economy, culture and social life of the region, and which describe the history and social and economic impacts of the Pak Mun dam on the fishing peoples of the region [2,6,47]. For villagers who have other options to diversify their economies



due to the availability of other resources or inputs (e.g., capital), fishing is one dimension of a more complex network of activities. However, opportunities for diversification are uneven across the region depending on location and ecological and socio-economic position. While these results are only a snapshot of what is happening in this region, they illustrate some of the diversifications taking place, as well as highlighting that diversifications differ between geographic locations because communities are not homogenous and cope differently to stressors based on their needs.

Although exploratory and based on only a small number of interviewees, the results are consistent with other research from the region in highlighting the continued importance of fishing as an economic and cultural practices. Interviewees in the nine communities experienced declines in the abundance and diversity of fish valued as food, and engaged in other household economic activities to support their families, including rice farming and the innovation and marketing of fishing assets. Stories of youth leaving communities (rural–urban migration) in search of employment and education were also shared. Although exploratory, our work confronts theories that fishing is a livelihood practice of “last resort”. Narratives suggest that both fishing and diversification to other activities have been both necessary and a choice among villagers, with the ultimate aim of offsetting the adverse impacts and associated insecurity created by the dam’s development. As a broader reflection, it is clear that villagers from all communities have struggled with the impacts of the Pak Mun dam and face many challenges in building and maintaining livelihoods that support their families. As more dams are proposed in the Mekong River basin as a means of creating power and economic opportunity in urban centers, more research is needed to understand the complex ways in which villagers upstream, downstream and elsewhere experience the socio-economic and ecological impacts.

**Author Contributions:** The study was conceptualized by D.A. and B.P. The methodological approach and development of the survey instrument involved both authors and representatives of participating communities. Data collection and verification of data with participating individuals and partners was led by D.A. Data analysis was done by the lead author (D.A.) and guided by and. The manuscript was prepared by D.A. and B.P. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the Social Science and Humanities Research Council of Canada with a grant to Parlee (SSHRC PG 895-2015-1024 Parlee).

**Acknowledgments:** We are grateful for the support of those individuals who participated in the study. Significant thanks to Kanokwan Manorum and her staff and students including Sirasak (Toe) Gaja-Svasti at Ubon Ratchathani University in Thailand, whose translation support was key to the success of the research.

**Conflicts of Interest:** There are no conflicts of interest reported by any of the authors.

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