

AN ABSTRACT OF THE THESIS OF

Brendan A. Galipeau for the degree of Master of Arts in Applied Anthropology
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This ethnographic research examines socioeconomic vulnerabilities to resettlement from a large hydropower dam and agricultural commodification in a Tibetan village in Yunnan Province, Southwest China. After providing an initial background on the dynamics of the research region and hydrodevelopment on its rivers, the research framework of examining vulnerability through a lens of political ecology and local knowledge is outlined. Utilizing this framework, the socioeconomic strategies surrounding agriculture and commodified forest products within the study village are initially outlined through the use of oral histories, previous literature, and quantitative household survey data. After providing a detailed background on these income strategies, vulnerabilities to resettlement are examined through qualitative analysis of individual household interviews. This analysis shows that village households are highly reliant on the village's specific location in order to collect the resources and pursue the agriculture that they do; making them vulnerable to future resettlement. The analysis also shows that in the opinions of villagers, a good standard of living is significantly defined by their ability to pursue specific economic strategies. Next, interview results are analyzed to show how agricultural commodification and a

very high reliance on one government sponsored company to purchase crops has also made the village highly vulnerable economically. The thesis concludes with reflections on future hydrodevelopment and resettlement scenarios within the village, and provides recommendations to improve local level resilience and promote better capacity to adapt to change.

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Socio-Ecological Vulnerability in a Tibetan Village on the Lancang River, China

by
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I understand that my thesis will become part of the permanent collection of Oregon State University Libraries. My signature below authorizes release of my thesis to any reader upon request.

Brendan A. Galipeau, Author

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TABLE OF CONTENTS

	<u>Page</u>
Chapter 1: Introduction	1
Research Questions.....	4
The Tibetan People of Diqing Prefecture and Deqin County	5
Cultural Aspects of Life in Meilishi.....	12
Chapter 2: The Mekong-Lancang and Hydrodevelopment on Yunnan's Rivers.....	16
Tibetan Cultural Importance of the Lancang	16
Hydrodevelopment in Yunnan	19
Previous Research on the Impacts of Dams on Yunnan's Minority Communities.....	22
Chapter 3: Theoretical Foundations. The Importance of Ethnoecology and Local Knowledge in Assessing Vulnerability from a Political Ecology Perspective.....	26
Vulnerability in Social-Ecological Systems: Research and Theory.....	27
The Political Ecology/Economy Approach.....	30
Using Local Knowledge to Study Vulnerability and Promote Resilience	35
Chapter 4: Research Methods.....	41
Data Collection.....	45
Background on Adong.....	47
Data Analysis.....	49
Limitations.....	50

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Chapter 5: Natural Resource Economics and Agriculture in Northwest Yunnan and Tibet.....	51
Background on Harvesting and Commodification of Chong Cao or Caterpillar Fungus.....	51
Current Chong Cao Harvesting in Yunnan and Meilishi.....	57
Matsutake, other Mushrooms, and Non-Timber Forest Products.....	59
Cash Agriculture of Walnuts and Grapes.....	66
Subsistence Crops and Changes in Diet.....	73
Breakdown of Various Natural Resource Income Sources.....	75
Chapter 6: Socio-Economic Strategies and Vulnerabilities to Resettlement.....	78
Village Perceptions on the Importance of Various Natural Resources and Cash Crops.....	78
Changing Use of Natural Resource Commodities.....	84
The Importance of Meilishi's Location.....	86
Vulnerabilities to Resettlement.....	89
Chapter 7: Agricultural Market Vulnerabilities.....	99
The Shangri-La Red Wine Company and Government Subsidized Agriculture.....	100
Ramifications for Food Security.....	105
Chapter 8: Conclusion.....	109
Reflections on Future Hydrodevelopment	110
Recommendations for a Resilient Future.....	115

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Broader Implications and Closing Thoughts.....	118
Bibliography.....	122

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Map of Yunnan and its rivers showing Meilishi in the far Northwest.....	6
2. A village elder with yarn woven in her hair and a colorful apron.....	13
3. The Lancang River flowing beside Meilishi's agricultural fields.....	19
4. Map of dams on the Lancang.....	23
5. Chong cao.....	53
6. A villager with a pair of recently collected chong cao.....	53
7. The fungal fruiting body of a chong cao seen growing out of the soil.....	54
8. Villagers present their matsutake to the marketer to be weighed and priced.....	63
9. Matsutake are separated by the marketer's assistants into three different qualities.....	63
10. An approximately 80 year old walnut tree.....	68
11. The researcher carrying a bag of walnuts	70
12. Adong in the tree with his bamboo pole.....	70
13. Meilishi's vineyards.....	73
14. Mean and Percent of Total Income Sources in Meilishi.....	76

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Primary Sources of Income by Household Response.....	79
2. Scaled Responses on the Importance of Various Natural Resource Commodities.....	81
3. Qualitative Themes for Good Standard of Living.....	87
4. History of Development Projects.....	92
5. Future Development Plans.....	92

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Chapter 1: Introduction

Typically when we hear the words China and Tibet in the U.S. there are a lot of stereotypical thoughts that come to mind. In terms of China, we hear about the human rights issues, factory workers, a harsh rural urban divide, etc. When we think about Tibet, we may imagine a mystical Buddhist paradise hidden in the Himalayas in the likes of James Hilton's 1933 novel *Lost Horizon*, or in the more modern sense we may imagine a religiously and socially oppressed country. I admit that when I first rather haphazardly and by fluke found myself traveling to this part of the world for two months for the first time in 2007, I did not know entirely what to expect. Nor that I would be moved into a five year long journey leading up to the present day that also has no end in sight. I admit that I did have some ideas about entering an ecological wonderland so to speak when I learned I would be visiting the Himalayas, which many Westerners consider quite mystical, but I had no idea of the cultural journey I was about to embark on that would eventually lead to the creation of this thesis.

Southwest China's Yunnan Province could be described as an anthropologist's and an ecologist's dreamscape. Roughly the size of Germany, it contains 25 ethnic minority groups each with a distinct cultural heritage (Tapp 2010). Beyond this, the area inhabited by these many groups extends from tropical forests in the south bordering on Southeast Asia, to high mountain ranges as high as 22,000ft in the north in the eastern flank of the Himalayas. Imagine an area like this and all of the rich natural resources that it must possess. It is one of the most biodiverse temperate regions on earth (Biodiversity Hotspots 2007), and presents its people (and the

Chinese government) with an abundance of opportunities. One of these is highly abundant hydropower resources that can be used to supply eastern China's burgeoning cities (Magee 2006). This hydropower potential is primarily located on three rivers, known internationally as the Yangtze, Salween, and the Mekong, and known in this part of China as the Jinsha, Nu, and Lancang respectively. These three rivers each tumble down off of the Tibetan Plateau north of Yunnan, and enter into steep parallel gorges, all running within less than 50 miles of each other in the northwest part of the province (Voices of a Sacred Land).

This thesis is the story of one Tibetan village called Meilishi (梅里石, or roughly Meilishui in the local Tibetan language) hereafter referred to as Meilishi, on the Lancang in Northwest Yunnan. My hope is to capture the challenges that the village facing as it tries to cope with living in a modernizing world under an agricultural and forest product based economy. Additionally, I also wish to paint a picture of what the quality of life or standard of living is here today through the eyes of Meilishi's residents, and the challenges that they may be facing in the future as the government turns its eye to their section of the river to meet its energy needs.

When I first initiated the plans for this project in the summer of 2010, I knew that I wanted to in some way study the potential impacts of hydropower on natural resource based economics in Southwest China. I was beginning graduate school as part of a grant that was specifically focused on this topic, and it was something that had been interesting to me as well since I first entered this part of China three years earlier as an undergraduate field student, specifically learning about the damming of

the Mekong and Salween from a NGO our class met with. Knowing that doing research anywhere that dams already existed was more or less out of the question due to issues of political sensitivity, I turned my attention to the upper section of the Lancang in Northwest Yunnan. I knew that at some point the government wanted to build dams here that could potentially affect the local people. I also specifically knew some important facts about Meilishi, having visited there and briefly interacted with the villagers in the spring of 2009. At that time I learned that this village was engaged in the collection of a non-timber forest product¹ hereafter referred to as *chong cao*, that was highly commodified across China, but occurred only in Tibetan areas; providing Tibetans with a very strong and important source of income in China's growing market economy (Winkler 2010a, 2010b, and 2008a).

Having visited the village during the collecting season for *chong cao*, and also having witnessed various agricultural activities in the village, specifically with respect to a growing cash industry of growing grapes and walnuts, I decided that Meilishi would be an excellent site to pursue the type of study I was imagining. Here was a village that appeared to have a highly place based market economy, relying on *chong cao* and agriculture to meet its needs, so what would happen if this village got relocated at some point in the future to make way for a large reservoir? This began as the underlying question for this project, but after I conducted my field work in

¹ The product is known by many names and carries with it a highly complex biology and history. In English it is called caterpillar fungus, in Chinese *dong chong xia cao* (冬虫夏草, which translates as “summer grass winter worm”, though the literal translation of *cao* is actually insect), or simply *chong cao* (虫草, grass worm “insect”). In Tibetan it is called *yartsa gunbu* or simply *bu*. In Meilishi, it is referred to by its short Chinese name, *chong cao*. For more thorough details on the specific biology and history of *chong cao* see Chapter 5.

Meilishi in September of 2011, I quickly discovered that in addition to trying to find out more about how reliant the villagers were on *chong cao* and other local resources, and thus how vulnerable this economy might be to a perturbation like resettlement, there was another level of economic vulnerability in the immediate future that existed in the village as well. This had to do with the growing of grapes, something that has entirely transformed the agricultural fields of the village over the past eight years into somewhat of a mono-crop with respect to cash cropping; a mono-crop that only has one market available from which to procure sales, which while good in price, does not appear to be stable from year to year. Having learned this, I adapted my research questions to look both at short and long term vulnerabilities in the village.

Research Questions

1) What is the state and composition of the resource based economy in the village?

Specifically, how do the villagers utilize things like *chong cao* and grapes to make money, and how reliant are they on these things in order to live a quality life? If they did not receive income from one of these sources, would they be vulnerable to economic hardship?

2) How important is the village's location to being able to pursue and collect things like *chong cao* and grow the crops that it does?

Does the village's location make its households economically vulnerable to resettlement?

These are the questions that I seek to answer in this work and through the story that I uncovered during my time in Meilishi. Through doing so, and by drawing on my literature review and theoretical background in Chapter 3, I also seek to show how my study in Meilishi can be used as a case study to look at vulnerability in a broader

global way, and how my research can contribute to the emerging fields of research and theory in vulnerability and resilience in socio-ecological systems. Before I do this I want to first provide an introduction to the Tibetan people that inhabit Northwest Yunnan, and the also some basic geography of the region to help paint a picture of the space in which Meilishi exists.

The Tibetan People of Diqing Prefecture and Deqin County

Meilishi is in the northernmost section of Yunnan Province's Diqing Tibetan Autonomous Prefecture, in Deqin County, which is one of three counties within Diqing Prefecture. In China, regions are administered in relatively the same system as the United States. The country is divided into provinces, autonomous regions, or municipalities (like Washington D.C.), which are then divided into prefectures, counties, townships, administrative villages, and natural villages. A natural village is the traditional village unit in which all households share kinship ties. After the establishment of the People's Republic of China in 1949, administrative villages were added which are now the smallest form of government. In areas that are dominated by ethnic minority groups, known in China as nationalities or *shaosu minzu*² (少数民族), autonomous governments are often set up, in which the region will be primarily governed by the dominate minority group. Diqing is Yunnan's only Tibetan prefecture and two of its three counties including Deqin where Meilishi is located, are

² China includes 56 officially recognized nationalities including the majority Han nationality. Yunnan Province alone contains 25 of these 56 nationality groups.

also Tibetan autonomous counties. Meilishi is located in Foshan township of Deqin, the northernmost tip of all of Yunnan before one either enters The Tibetan Autonomous Region or Tibet proper to the north and west, and Sichuan Province to the east (see figure 1 below for a map of the region).



Figure 1. Map of Yunnan and its rivers showing Meilishi in the far Northwest. (Baseline map courtesy of Bryan Tilt)

The Tibetan people that live in Diqing are somewhat unique from those in other areas, in that they have had a much longer standing relationship with the Chinese and other minority groups through trade and other interactions than those that live in the central regions of Tibet. One of the oldest and biggest trade routes in all of Asia, between the Chinese and Tibetans, the ancient Tea-Horse Road, passed directly through this area (Freeman and Ahmed 2011). In many ways, this has helped to make the region more harmonious than what one might hear about in the typically western news coverage of Tibetan areas in China. One county south of Deqin is Zhongdian, or Gyalthang in Tibetan³, the prefectural seat which is located on a plateau of about 10-11,000 ft. This plateau and the mountains and river valleys surrounding it, including the Lancang where Meilishi is located possess very rich forests and agricultural land, which as Goodman (2001: 389) suggests may contribute to the Tibetans of Diqing being some of the happiest and most fortunate among their ethnicity in China. Prior to 1998, when the government unilaterally banned commercial logging, this practice also provided a booming industry for many, which has since been largely replaced by tourism (though not in Meilishi).

Having spent much time here over the past five years, I am somewhat apt to agree with Goodman. The majority⁴ of the Tibetans that I have interacted with in

³ Note, Zhongdian City and County were both officially renamed Shangri-La (Xiangelila in Chinese) in 2001 after the location in the famous novel, *Lost Horizon* written by James Hilton in 1933. This was part of a government program to promote tourism in the area and it is a known fact that Hilton himself never visited Tibet. However much propaganda has claimed that Zhongdian is indeed the “real” Shangri-La, and most Chinese now refer to it by this name. For more on this see Hillman (2003).

⁴ There is one exception to this that occurred shortly after my time in Meilishi, but this man came from India and made it clear he was not a fan of Shangri-La or its people, insisting that they have more or

Diqing have been some of the most happy and gregarious people I have ever encountered in China, nor have I personally ever witnessed or experienced any discontent among these people towards the Chinese. Intermarriage between the two groups (and other minorities) is high, and the local governments are also incredibly liberalized with respect to foreign activity in the area, which is quite different from the Tibetan Autonomous Region or Tibetan Prefectures in other provinces, such as Sichuan and Qinghai. The welcoming atmosphere and social openness of Diqing's Tibetans has indeed been documented historically from the earlier twentieth century as well. During this time, when many westerners adventured through western China as botanical explorers, the famous plant hunter George Forrest came to Zhongdian during one of his early trips to China. Having previously been taken aback by the local people he encountered elsewhere in Yunnan, Forrest later remarked how incredibly welcoming and friendly the Tibetans of Zhongdian were at that time; making him feel more at home than he previously had anywhere else in China (Mueggler 2011a: 56; Mueggler 2011b).

Today Diqing has more or less become a melting pot so to speak for research on Tibetan culture, agriculture, environmental conservation, etc. due to the liberal

less been transformed into Chinese. However since he was not from the area I consider his resentment towards the Chinese and the local Tibetans an exception. Other academics who have been working in the region far longer than me who encountered this individual also agreed. Why this individual is living in Shangri-La is complicated and could entail an entire manuscript on the children of Tibetan refugees who return to China.

policies that the prefectural government has instituted here⁵. As one expert on Tibetan ethnoecology once told me, by choosing to do research on *chong cao* in Yunnan, I was certainly picking the best place for ease of access and also with the best support for foreign researchers.

Cultural revivalism among Diqing's Tibetans is a huge movement⁶, (Kolås and Thowsen 2005) and is to a large extent driven by government sponsored tourism development, both targeted towards domestic Chinese tourists and foreigners (Hillman 2003; Kolås 2008). As Hillman (ibid) argues, while much of the new Tibetan culture that has been created post 2001 with the renaming of Zhongdian or Gyalthang as Shangri-La is arbitrarily new, and not in any way authentic to what a traditional Zhongdian might have looked like, this does not seem to be an issue for many of the local people. Overall, taking pride in a "newly recognized" Tibetan culture seems to be making Zhongdian a better place for the local people through increased tourism development. This is rather different from a similar project in the neighboring Lijiang Prefecture, home of the Naxi nationality where tourism has reached a point of commodification like that of Disneyland⁷.

Things are however different in some parts of Deqin County six hours to the north where Meilishi is found. Some areas of Deqin are indeed heavily reaping in the benefits of tourism, specifically those villages located at the foot and center of

⁵ There are many good examples of research on several different aspects of local life in Diqing, for some examples see Glover (2005), Grumbine (2010), Hillman (2003), Kolås (2008), and Kolås and Thowsen (2005).

⁶ Very similar forms of revivalism have been occurring throughout Southwest China among different minority groups. For examples see McCarthy (2009), (Schmitt (2011) and Wellens (2010).

⁷ For more on this see McKhann (2001)

Yunnan's highest mountain, Meili Xueshan or Meili Snow Mountain, known in Tibetan as Khawa Karpo. This is one of the most sacred mountains in all of Tibetan Buddhism (Da Col 2007; Salick et al. 2007), and Tibetan pilgrims as well as trekkers both foreign and Chinese all travel to the region to make *kora* or circumnavigate the mountain, as well as visit other sacred sites and popular villages that cater to tourists. One unique aspect to Khawa Karpo as well is that its range is the dividing point between the Lancang River valley and the neighboring Nu River valley, so people who hike around the mountain get the opportunity to visit both of these great rivers.

Meilishi is located about one hour's drive north of where most of this activity occurs, leaving its villagers to practice what has been deemed primarily agro-pastoralist lifestyles (Wilkes 2006). Villagers grow crops and herd yaks and *dzos*⁸ for their meat and dairy products, and are also heavily engaged in the collection and sale of non-timber forest products (Guo 2008). As I discovered, the most important of these resources to villagers was *chong cao*, but also other mushrooms and herbs, including the highly prized *matsutake* (Japanese) mushroom, which is collected and then quickly exported to Japan where it is highly valued (Menzies and Li 2010; Winkler 2008b; Yeh 2000). While Meilishi is actually indeed the ending point for the *kora* around Khawa Karpo, and where the path from the mountain comes down and meets the Lancang River, the large majority of people finishing this trek simply hop in a car upon arriving and head straight back for the county or prefectural seat.

⁸ A *dzo* is a cross between a yak and a cow. These are far more common in Northwest Yunnan than true yaks because they can survive at much lower elevations than yaks but still provide the same abundance of dairy, meat, and other resources. As Meilishi is located at around 5,000ft in elevation in a valley bottom, *dzos* are certainly a better choice.

According to one informant in the village who owns a small guest house, this has however only been during the last two years. Before this time only a poor dirt road existed, which required people to stay overnight and did indeed provide him with some small income from tourism. Still, Meilishi has never promoted or developed itself for tourism either, in the way that the villages further downstream have, probably because its location is not conducive to such activity. It's more or less off the beaten track.

But this has not stopped the villagers of Meilishi from living what they deem to be fairly good standard of living, as I will demonstrate in later chapters. By combining agriculture and the harvest of forest products, Meilishi's villagers have avoided having to look for work outside their village, and in their own words their village is overall better than others in the immediate area. With respect to crops, as previously mentioned, they have filled their fields with grape vineyards, but they also intercrop these vineyards with corn, wheat, barley, and a large variety of vegetables all of which are used for personal consumption and as animal feed. Scattered throughout the village are walnut trees as well, the nuts of which are harvested and both sold and consumed; each family possessing one or two large trees, along with a new orchard that has been planted on a slope above the village in which each household will gain several more. Also grown throughout the village are a number a fruit tress used for personal consumption including apples, pears, peaches, and Sichuan pepper (*hua jiao* 花椒). Quite unlike the higher mountain areas, the bottom of the Lancang River valley is incredibly warm all year round, which along with increased access to markets,

is why the village can benefit from such a rich diversity of agriculture (Moseley and Tang 2006; Salick et al. 2005)

Cultural Aspects of Life in Meilishi

Culturally, the villagers of Meilishi are more or less the same as other Tibetans, although slightly less devout in their traditional customs. The villagers do consider themselves to be Buddhist, of the Yellow Hat or Gelukpa sect of Tibetan Buddhism of which the Dalai Lama is the spiritual leader. However the village does not possess its own temple, and according to the father of my host family (hereafter referred to by the pseudonym of Adong), they will only travel to worship in a temple across the border in Tibet proper on special occasions. However, each home does contain a small altar or shrine for worship and one home I visited did in fact contain a picture of the Dalai Lama, which can be somewhat of a rarity in China for political reasons, albeit more common in Yunnan. Most “traditional” culture seems to primarily be held onto only by the elderly, the majority of whom carry a necklace of prayer beads known as a *mala* with them and can be observed silently counting the one hundred and eight Tibetan prayers, even when engaged in conversation. Some of the older men might also still wear a short of kilt like object over their pants. The majority of the older women all weave colored yarn into their hair or wear it as a bonnet, and also accompany this with a colorful apron around the waist (see figure 2 below). Additionally, early each morning an elder member or each household will typically climb to the roof and burn some cypress or juniper branches as incense and recite prayers, a common daily practice throughout the Tibetan region.



Figure 2. A village elder with yarn woven in her hair and a colorful apron

While Tibetan culture as one might expect to see it does not seem to be prevalent in the daily activities of the young or even middle generations in the village, it does exist, although in a slightly different form. One of the major components to the tourism development in Yunnan's Tibetan regions, and the cultural revival as described by Hillman (2003), has been a proliferation of new Tibetan pop music and music videos that highlight the beauty and wonder of Shangri-La. This has caught on

quite noticeably among the youth in Meilishi, who at night can be found watching a multitude of music videos highlighting Tibetan life. One specific example that comes to mind from my time in Meilishi was during my drive to leave the village, when we gave a ride to a local youth who desired to get to the county seat in Deqin. During the trip our driver played CDs with many Tibetan pop songs and this young man who was riding along with us proceeded to sing along for most of the ride, having previously memorized all of the lyrics.

Having set the stage and placed the lives of Meilishi's villagers in the context of the greater geography of Northwest Yunnan, and given a picture of their daily life, this thesis will now proceed as follows. In Chapter 2 I will provide a literature review and background on the Lancang-Mekong River and its Tibetan cultural significance, as well as the Chinese government's hydropower development plans, and how they could potentially impact the Lancang River and area surrounding Meilishi. In Chapter 3, I outline my theoretical framework of vulnerability research and political ecology, and how local knowledge and ethnoecology can be used to both assess socio-economic vulnerability and inform more resilient futures. Chapter 4 briefly summarizes the qualitative and quantitative methods used to generate a picture of Meilishi's household economics strategies and to measure economic vulnerability to hydrodevelopment. Chapter 5 then provides a background of Meilishi's or rather Yunnan and Tibet's rural economic strategies, specifically with respect to *chong cao*, *matsutake*, other non-timber forest products, grapes, and walnuts. Chapter 6 describes the results and outlines how Meilishi's socio-economics demonstrate vulnerability to

hydrodevelopment. Chapter 7 explores the additional vulnerabilities I discovered in Meilishi due to agricultural commodification. Chapter 8 summarizes my results in describing how Meilishi's economy has evolved and developed into its present day form, provides reflections on future hydrodevelopment, and concludes with recommendations to promote future resilience to the vulnerabilities discovered during the research.

Chapter 2: The Mekong-Lancang and Hydrodevelopment on Yunnan's Rivers

The Lancang River plunges from its glacial sources high upon the Tibetan Plateau into the deep and dissected gorges of China's Yunnan Province. It is from these gorges flanked by mountains stretching over 20,000 feet in Northwest Yunnan that the Lancang River flows into the central canyons and valleys of the province, before exiting China to become the Mekong River. From this point the Mekong River serves as the lifeblood of many downstream agricultural and industrial communities in Myanmar, Laos, Thailand, Cambodia, and Vietnam. As one of the world's most important river basins, the Lancang or Mekong River Basin is home to over 60 million people, many of whom directly rely on the river for their daily livelihoods through agriculture and fisheries harvests (Magee 2006). This reliance is in many ways reflected in the river's name, Mekong, which is a shortened version for the Thai name of the river, Mae Nam Khong, which translates as "Kong, mother (of) water" (Eustis and O'Shea 2006; O'Shea 2006). Within China, the basin is home to some communities that rely on subsistence agriculture, many of which are ethnic minorities.

Tibetan Cultural Importance of the Lancang

The Lancang River has many names throughout its long course, north of Yunnan, in the Tibetan Autonomous Region and Qinghai Province where its source is located it is known as the Zaqu in Tibetan (Magee 2011). In Northwest Yunnan where Meilishi is located, the villagers refer to the river (and the neighboring Jinsha and Nu

Rivers) by yet another set of local Tibetan names as told to me by two village elders. When the Lancang is flowing heavily they call it roughly Yaje or Yeja. The Jinsha is called Deche, and the Nu, Remengeche. As the villagers explained, Ya is a Tibetan character or word meaning musk deer, and their name for the Lancang translates roughly as “Deer Water.” This local use of names can in many ways be used to suggest that the local Tibetans may indeed attach a great sense of place and importance to their natural surroundings, as researched by Lin (2009). Similarly, sense of place as represented by the local natural resources a region provides may be seen as a potential indicator of vulnerability to resettlement, as discussed further in Chapter 6.

Tibetans (not specifically in Meilishi) attach great religious and cultural significance to their natural surroundings, including rivers like the Lancang. As documented in an interview with a 90 year old informant during a kayaking expedition further upstream:

“The river and the mountain are home to powerful spirits. We have to be careful to upset them. They are watched over by the spirits, so at least there will be peace.” (Eustis and O’Shea 2006)

This goes hand in hand with much research including around Meilishi on the importance of special sacred sites to Tibetans, and how in many ways, such importance has even acted as means for effective conservation of old growth forests and other important sites of biodiversity (Choezin 2003; Guo 2008; Salick et al. 2005). Additionally, Salick and colleagues (2005) indicated that further ensuring the

protection of Tibetan sacred sites in the Lancang region could be a highly effective strategy for protecting this biological hotspot.

While personal observation and that of others (O'Shea 2006) indicates that the Tibetans of Yunnan and other regions upstream do not interact with the Lancang River on a daily basis in the same agricultural manner as downstream cultures, there is still not much doubt that the river and its surroundings carry cultural significance. As documented by the Chinese anthropologist Lun Yin, the Tibetans of Deqin (though I could find no informants with similar stories in Meilishi) have a very rich mythology associated with the Lancang, and its neighboring rivers the Jinsha, Nu, and Dulong; attaching a special significance to the Lancang as a life bearing river:

“The Tibetan people describe the nature of their four main rivers in a series of important myths. The Nujiang River is the beautiful mother of all rivers, originating in Tibet and flowing south, and the Dulongjiang, Jinshajiang and Lancangjiang Rivers are her three sons. The Dulongjiang is the bad-tempered eldest son, who brings severe disasters and diseases to local people. The god of Kawagebo (author's note: this is another name for Khawa Karpo) Mountain punished such bad temper by changing the Dulongjiang's flow from the south to the west. The Jinshajiang River is the bold and uninhibited second son, bringing fortune and gold to the local people. The huge wave sounds made by this arrogant river enraged the god of Kawagebo, who changed the river flow from south to east. The last son is Lancangjiang, the Mekong River. He is both kind and peaceful, bringing abundant fruits and agricultural products to those who live along his banks. The stories of the rivers tell people what to expect from their natural environment and how they should behave towards these primary sources of life-giving water. The Tibetan people of Deqin have always chosen the plateau and slope lands around the two banks of the peaceful Lancangjiang River for their living and production.” (Yin 2012)

Clearly the Lancang is an important part of daily life among Deqin's Tibetans, who have chosen to make their home here, and as I will show in later chapters, their choice

has been highly rewarding in the case of Meilishi, due to the rich resources that the region provides.



Figure 3. The Lancang River flowing beside Meilishi's agricultural fields.

Hydrodevelopment in Yunnan

The construction of large dams⁹ is a major part of China's economic development strategies, and the Chinese government is continuing to construct these

⁹ Large dams are defined by the World Commission on Dams (2000) as any dam over 15 meters in height or any dam with 3 million cubic meters of storage capacity.

projects at a rapid pace (Magee 2006). Hydropower currently supplies China with 16 percent of its total electricity, and with a burgeoning economy that is highly reliant on coal-fired power plants, China's government sees hydropower as a valuable source of clean energy (Rosen and Houser 2007). Hydropower in China's western regions such as Yunnan specifically, (where the vast amount of the hydropower potential is housed on the Lancang, Nu, and Jinsha), is also a large part of two national development strategies. The first is the "Great Western Opening" policy (*xibu da kaifa*), a strategy with several objectives. The first is to develop western China's remote, rural, and generally poor and marginalized regions through large scale infrastructural development, to accelerate development and thereby reduce the sizable gap between China's western and eastern provinces.

The second goal of the strategy is to help solve what is known as the nationalities problem (Harrell 1995; Rossabi 2004; Tilt 2010: 31-32). In general, China's minority nationalities including Tibetans, who primarily inhabit the western regions, suffer from lower economic prosperity and more marginalization than the majority Han Chinese nationality. The solution of the "Great Western Opening" in solving this problem is to promote and fund large scale infrastructure development and to harness the vast natural resources of the west, to both alleviate economic disparities between the east and the west and bring greater prosperity to minority peoples. Despite this, the program utilizes a very top down approach and does not take into the account the opinions, knowledge, and economics of the primarily western minority communities which it is said to benefit (Tilt 2010: 32). The second program that

hydropower is a main player in, is the Send Western Electricity East policy, which is an attempt through the harnessing of western China's rivers to continue to meet the large demand for power in eastern China's great cities (Magee 2006; Tilt et al. 2009).

The Lancang River has become a major focus of these policies. Within the lower Lancang Basin in Yunnan, China originally planned a cascade of eight dams, which has since been scaled down to seven (Dore et al. 2007; Magee 2011). Within this cascade, four dams are very near completion with the other three expected to be completed within the next decade. Two of these dams, Xiaowan and Nuozhadu, will be some of the world's tallest arch dam structures¹⁰ and create very large reservoirs, inundating vast tracts of land and resettling thousands of people (Magee 2006). Along the upper sections of the Lancang where Meilishi is located, the government also has plans for another cascade series of dams, ranging anywhere in number from five to eleven dams (Magee 2011; UNESCO 2006). Compared to what Magee (ibid) refers to as the "lower cascade" of dams, there is very little information published on the "upper cascade," primarily due to the fact the roads and other infrastructure needed to construct such projects have only recently begun to enter the region.

Meilishi is located in the upper most section of the "upper cascade," and current culling of sources by Magee (ibid) indicates that a very large dam known as Gushui¹¹ may be built just downstream of Meilishi, and would most certainly inundate the village were it to be constructed. This seems to be confirmed by a series of

¹⁰ The well known Three Gorges Dam on China's Yangtze River is the world's largest overall dam structure. However Xiaowan and Nuozhadu will actually be even taller.

¹¹ Gushui would become tallest dam in the entire Lancang Basin, even larger than Xiaowan and Nuozhadu. It would also have the third greatest energy generating capacity after these other two.

Chinese archeological studies that have already been conducted further upstream of Meilishi in the Tibetan Autonomous Region, to survey cultural sites that the same dam at Gushui will inundate (Habibu 2010). Personal observations show no sign of dam construction at Meilishi as of yet, however there are definite signs of construction at the next potential dam site identified by Magee (2011), downstream at a village known as Liu Tong Jiang. This dam, both by the look of it and by the information supplied by Magee (ibid), looks to be far smaller than the project planned at Gushui, appearing as though it may only inundate a few agricultural fields at Liu Tong Jiang village but will not force the village to resettle. However if the government's current system of building relatively small dams downstream of large ones in order to regulate flows remains consistent as seen with Xiaowan and Nuozhadu, the project at Liu Tong Jiang would appear to be meant to serve the same purpose as a flow regulator for the eventual project at Gushui. See Figure 3 below for a map of the various dams planned on the Lancang in Yunnan.

Previous Research on the Impacts of Dams on Yunnan's Minority Communities

Despite the local growth targets and goals that are touted by the government as stemming from the development of dams on Yunnan's rivers, the vast majority of the power that is and will be generated by Yunnan's large dams is actually transmitted thousands of miles east to supply its vast eastern cities, providing little tangible benefits to those living in close proximity to the dams (Dore et al. 2007; Magee 2006).

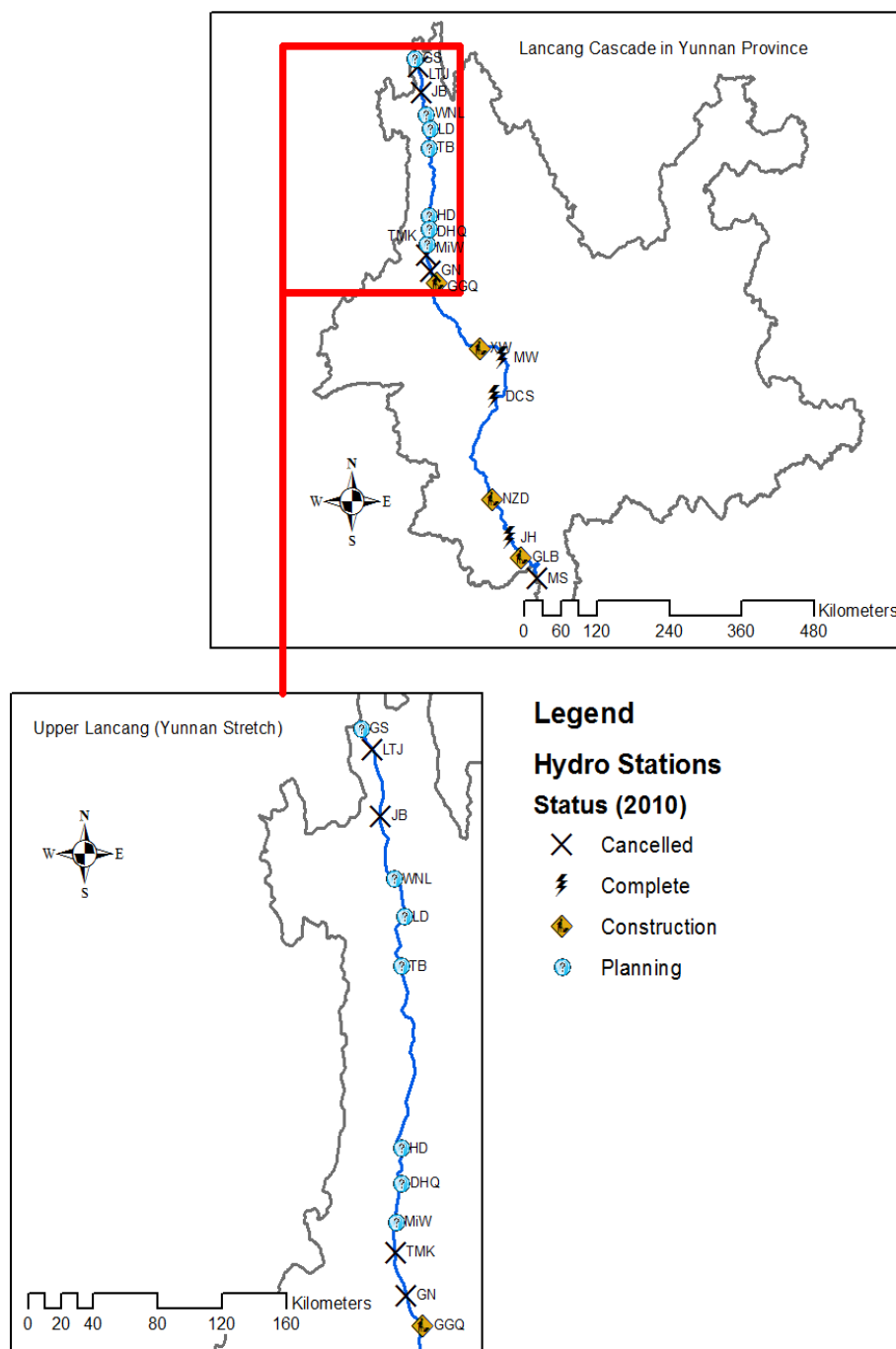


Figure 4. Map of dams on the Lancang. XW is Xiaowan Dam, NZD is Nuozhadu Dam, LTJ is Liu Tong Jiang Dam, and GS is Gushui (Magee 2011). Personal observation indicates that Liu Tong Jiang is indeed going forward and not cancelled as Magee originally suggested. Map courtesy of Darrin Magee.

What benefits are provided to local communities are usually limited to the provincial and lower level governments rather than the actual villages located where the dams are, which are very often resettled and fragmented due to the flooding of reservoirs (Tilt et al. 2009; Zhang et al. 2008). These communities, which in the case of the Yunnan's dam locations are most often made up of minority groups, can suffer from many direct and indirect negative impacts created by dams, including losses of local ecological knowledge and social fragmentation (Chen 2008; Tilt et al. 2009), and also a very strong lack of information and awareness provided to them regarding the potential and future possibility of resettlement or other impacts that dams may cause (Zhang et al. 2008). To this end, even local governments often suffer from a strong lack of information provided to them about impending hydropower projects and how they may prepare for them (Zhang et al. 2008).

With respect to the informational flow about future dam projects and their potential impacts, previous survey research in the Nu Basin, which neighbors the Lancang, has shown that the further north and away from government and infrastructural centers communities are located, the less aware they are about dam projects planned in their vicinity. This lack of information and also consultation about dam building in these regions has also been correlated with communities consisting of primarily ethnic minority groups, (which include Tibetans), and also a lack of ability to speak the country's standard language, Mandarin Chinese (Foster-Moore 2010; Tullos et al. 2012). This is a key piece of information in this thesis, because Meilishi village is located in the northernmost portions of the Lancang, long distances away

from any government centers, and consists almost¹² completely of minority Tibetan peoples. Thus, as is being suggested in the neighboring Nu River basin, Meilishi could have a high a level of vulnerability to dam building and low institutional capacity and resilience to adapt to these changes (McNally et al. 2009; Tullos et al. 2012). Such research has not however, been directly undertaken in upper Tibetan reaches of the Lancang where Meilishi is located, which makes this study unique.

¹² One household did indeed have a member from the Naxi minority who married into the village from Lijiang Prefecture to the south.

Chapter 3: Theoretical Foundations. The Importance of Ethnoecology and Local Knowledge in Assessing Vulnerability from a Political Ecology Perspective

In this chapter I highlight my theoretical framework of ethnoecology and local knowledge, as well as the concept of vulnerability and how it has been described in previous literature. In originally designing this study and the research questions for it, I found myself utilizing the terms traditional ecological knowledge, and resilience much more frequently. However over time and while conducting my research, I came to realize that what I was measuring and trying to understand in Meilishi was in fact vulnerability much more so than resilience. As Innes and Booher (2010) and McNally et al. (2009) describe, resilience is much more the capacity to deal with and absorb vulnerability. To this end, I have continued to utilize the term in this chapter in laying out how research can be conducted that has the potential to enhance the resilience of social systems to significant perturbations; the applied goal of this thesis in the conclusion, where I make recommendations as to how Meilishi's economic systems can be made more resilient based upon the vulnerabilities that I discovered.

With respect to local knowledge and the use of this term over that of traditional ecological knowledge, in many ways both the agricultural and other ethnoecological practices in Meilishi are fairly recent, grapes being the best example. Thus, I have found it difficult to define or be able to say when knowledge truly becomes "traditional," versus simply being a local form of knowledge about certain aspects of life that a population possesses. Therefore I prefer use of the term local knowledge, which in fact has a rich history in anthropology, as has since been applied through the

eyes of respected anthropologists more broadly to the management of natural resources and systems.

Vulnerability in Social-Ecological Systems: Research and Theory

One of the most thorough and seminal works on vulnerability research and assessment methods appeared in 2006, in the *Annual Review of Environment and Resources*. As the authors Eakin and Luers point out in their thirty page review of research and literature, with the advent of the scientific and academic community's interest in global environmental change during the 1990's, research on multiple types of vulnerability also appeared. However what has also happened is that research on vulnerability has more or less diverged into three spheres of study: risk hazard assessments, political economy and ecology research, and ecological resilience assessments. However with this divergence full comprehensive analysis is very difficult to realize and to locate¹³. In fact, with specific reference to studying the vulnerabilities of large hydropower projects, there has been a call for better more comprehensive analysis in better understanding how multiple spheres of impact can affect a human-environment system (The World Commission on Dams 2000). Indeed since the work of Eakin and Luers (2006), such assessment methods have begun to appear (see note 13 below; International Hydropower Association 2010). In calling for comprehensive vulnerability research, Eaken and Luers also indicated that each of the different fields approaching vulnerability research characterize it differently, but

¹³ This thesis is component of the social and economic part of a greater project that is meant to provide just such analysis utilizing three pillars of measurement: Socioeconomics, biophysics, and geopolitics. See Brown et al. (2009) and Tullos et al. (2012).

they give a general definition for it as conveying an idea of susceptibility to damage or harm (2006).

Subsequent to the work of Eakin and Luers (2006), Adger presented researchers with a second review article on vulnerability research, which he stated was meant to complement the work of Eakin and Luers through a slightly different approach and definition of the term. Here, Adger definitively defines vulnerability as “the state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.” (2006: 268). Adger also highlights that vulnerability research has allowed a strong convergence of research fields because of its focus on social-ecological systems, and the idea that human actions and social ideals are an integral part of how nature functions in the current world, which makes distinctions between natural and human systems arbitrary. To this end, Adger divides vulnerability research into two primary categories, antecedents and successors, exploring vulnerability before and after perturbations on socio-ecological systems occur respectively. Similarly, the author indicates that the concept of vulnerability is incredibly useful for research because it can be used to understand susceptibility to harm and powerlessness in both human and natural systems. Vulnerability research is distinguished from resilience research by explaining that while resilience is usually considered to be the magnitude of change that a system can absorb before it is shifted to a different state, vulnerability is rather more typically measured as a susceptibility to be harmed. Therefore research of these two concepts can go hand in hand quite well, with projects used to demonstrate how

the build up or erosion of resilience in a social-ecological system can then influence the level of vulnerability displayed by that system. Furthermore, good vulnerability research is described as that which can highlight vulnerabilities in a socio-ecological system, and provide suggestions for better governance and adaptive action that will promote resilience. Resilience in this sense is defined quite well in social-ecological systems by Cosens as “the ability of human communities to withstand and recover from stresses” (2010: 237).

This definition of resilience has in turn been combined by my colleagues in the Integrative Dam Assessment project (Tullos et al. 2012; Brown et al., 2009) with that used by Adger (2006) of vulnerability to describe vulnerability as: “the characteristic of a socio-ecological system that influences its capacity to anticipate, cope with, and recover from the impacts of dam construction and related infrastructural development” (Tullos et al. 2012). However for the purposes of this project, I have chosen to utilize Adger’s (2006) definition because my desire is to measure vulnerability and utilize these measurements as he suggests to inform better resilience; the counter or opposite to vulnerability as it is described by McNally et al. (2009). One reason for this decision is that Eakin and Luers (2006) as well as Adger (2006), suggest that both vulnerability and resilience are things that can fluctuate over time. This is important to note because in this research I have chosen to measure and capture through ethnography, what the vulnerability to hydrodevelopment is at this explicit time for one community.

Vulnerability research and definitions of vulnerability specifically focused on hydropower in China have also been recently established through the Integrative Dam Assessment Modeling project (see Tullos et al. 2002 and Brown et al. 2006), which this project is a portion of as well. McNally et al. (2009) define vulnerability as a lack in institutional capacity to deal with change, and or a risk of dispute. Based on this definition, the authors suggest these two factors can be measured on varying scales, from international, national, and provincial to community levels (2009). This suggestion is extrapolated based upon China's economic structuring and development methods. On a national scale, China is less vulnerable and stands to benefit economically in a very high regard from hydropower. However, it is also shown that on a small scale, there is more susceptibility to socio-ecological systems being vulnerable to dams for many reasons. But particularly due to a lack of public participation in and information about such projects, and an already lower economic status for rural ethnic minority communities that live in the Lancang and Nu River basins (McNally et al. 2009). However research that looks to specifically address these assumptions and observations, and make determinations about vulnerability in Yunnan's Tibetan Lancang communities as this does, has not yet been undertaken.

The Political Ecology/Economy Approach

This research takes two approaches to measuring vulnerability, one theoretical under the category of political ecology, and another under the umbrella of local knowledge and livelihood research as a methodological approach (more on this second

approach in the next section). As Eakin and Luers describe it, within political ecology research, vulnerability is characterized not as an outcome, but rather a state of being that is moderated by social and political processes and historical patterns of control and marginalization (2006). This stems from political ecology's history as a field of constructing environmental problems as social and political problems (Forsyth 2003; Peet and Watts 1996; Robbins 2004), as a response to what political ecologists call apolitical ecology, which lacks social and political components of understanding (Robbins 2004). Drawing on neo-Marxist thought, political ecology really began to emerge in the 1980's and early 1990's, suggesting that in capitalist societies, humans become more inextricably linked to nature through production and resource use, but that this also then brings up issues of justice in achieving fair distribution and access to the natural resources that are utilized (Forsyth 2003; Wolf 1972). This ideal began to emerge further into the 1990's as a critique of inequalities in resource access, due to poor governance and failed control over both natural resources and various underrepresented communities in the neo-liberal era (Escobar 1996; Pete and Watts 1996; Zimmerer 1996).

These ideas developed within political ecology based upon the idea that injustices were occurring, especially in the developing world, both against local populations and the natural environment, affecting both the resources that these people and the global population depended on in one way or another (Forsyth 2003; Pete and Watts 1996). In response to this, new sectors of research emerged that worked to better understand how local populations interacted with their natural environments,

and to better inform policies that would alleviate violations that were being made against local people. As Robbins (2004) describes it, political ecology has been used both as a critique or “hatchet” towards socially constructed environmental problems, and as a “seed,” to make suggestions and conduct research that can inform better governance.

As Forsyth (2006) suggests, in response to the call for more holistic representation, a critique emerged of earlier anthropological and environmental social sciences, such as the practice of cultural ecology by researchers such as Roy Rappaport and Julian Steward. These early approaches assumed that communities were bounded entities. By contrast, political ecology researchers considered different scales beyond the local. Furthermore, the early approaches of cultural ecology were “apolitical,” (Robbins 2004) that is, they considered things like energy, materials cycling, etc., but didn’t pay attention to power and politics. By contrast, political ecology strives to pay attention to power, politics, access to resources, etc. beyond a simple community level. In a sense, this is part of the direction of this project, to understand what localized natural resource economics exist in Meilishi, and to understand how future centralized development policies will perhaps impact them. The idea of cultural ecology within political ecology here being that we need to know what it is that is being lost or at least be able to come to understand how the local environments and cultures we are concerned about function, and how they might be vulnerable to other outside forces. Thus, tying political ecology into vulnerability research as Eakin and Luers (2006) suggest is one sphere of such research.

As Forsyth (2006) explains, prior to the development of political ecology, vulnerability was considered an ecological and scientific concept, but with the advent of this lens, it gained a new definition as exemplified in the following:

“A more anthropocentric account of environmental vulnerability, therefore, draws more attention to the social, economic, and political factors that may reduce people’s access to resources to withstand biophysical events or changes, rather than the biophysical changes themselves.” Indeed, approaches to risk that seek only to reduce the biophysical changes may indeed actually increase social vulnerability.” (Forsyth 2003: 197)

Similar to drawing upon Marxist thought of economic flux and power as a method of political ecology, the ideas on power relations of Foucault have also been useful to political ecologists in shaping our understanding of political relationships defining environmental problems and resource conflicts (Forsyth 2003; Robbins 2004). With respect to Foucault and his theories of power, these are very useful in helping to from an understanding of the relationships and dynamics between the Tibetans in this study and the dominant Han Chinese society. Foucault suggests that in western society, we consider sovereignty to be the central problem of rights between one dominant group and other subordinates (1980: 95). Basically, the dominant group controls whatever rights other groups can possess and what they are allowed to do within the society where they exist as subordinates. While minorities in China and all people including Han Chinese for that matter have seen significant increases in their livelihoods and wellbeing due to economic development over the last several decades (Tilt 2010), they are still controlled by an authoritarian system of governance. In such a system, knowledge becomes power as Foucault describes it, establishing its own networks and system by which it moves between different groups of people (1980:

106-107). However in China's system of governance, knowledge and power are not allowed to move about freely, keeping sovereignty in check and not allowing what Foucault calls the "normalisation of society" (1980: 107). This can be directly linked with some of the previously mentioned vulnerability studies on hydropower development in China's river basins.

Studies have found that access to information (knowledge) by local communities about dam projects that will directly affect them is scarce in certain situations, making them much more vulnerable to the impacts that such projects will bring (Foster-Moore 2010; Tullos et al. 2012). Similarly, local communities who tend to be the most affected by dams in China suffer from the strongest lack of ability to participate in decisions regarding their futures, due indeed to the structure and relations of power in China (McNall et al. 2009).

Within political ecology research in China, power relations, especially between governments and local agricultural communities have been shown to create a host of social issues, especially since the liberalization of markets in the 1980's. The examples are numerous, but include describing how the privatization and liberalization of agriculture has led to more exploitation of rural natural resources and labor (Muldavin 1996), and also studies exploring how centrally planned environmental control measures have actually negatively harmed local economic growth (Tilt 2010; Tilt 2007). Such studies have also explored the political components of relationships surrounding the collection of non-timber forest products, specifically *chong cao* and *matsutake* on which this study focuses (Lama 2007; Olsgard Stewart 2009; Yeh 2000).

A proliferation of research and literature on China in recent years relating to power dynamics and hydropower has appeared as well, and while not always couched within a framework of political ecology, all of these works certainly highlight how politics are playing a role in environmental planning and between different societal sectors and economic groups, including Yunnan's ethnic minorities (Hessler 2010; Grumbine 2010; McDonald 2007; Mertha 2008; Zhang et al. 2008). Such studies highlighting the political ecology of dam building have also extended beyond China as well (Öjendal et al. 2012; Johnston 2011; Turner 2011). Following in the steps of the above mentioned works, I see this thesis as both as "hatchet" and a "seed," highlighting ways in which various economic and other policies in China have laid the groundwork for Meilishi's vulnerability. Yet I also want to plant a seed to show in what ways the future of this village (and others around it) can be kept more prosperous and viable as functioning rural communities into the future.

Using Local Knowledge to Study Vulnerability and Promote Resilience

Having formulated a picture of how political ecology has formed a wing within vulnerability research and theory, I now conclude this chapter with a section describing the use of local knowledge and opinions in understanding vulnerability and in promoting conservation. In utilizing such a framework of local knowledge, it is also my goal to be able to make specific recommendations about better decision making processes for large scale infrastructural and hydropower development. An approach in natural resources planning that has been suggested can lead to much more resilient ecosystems and communities (Innes and Booher 2010: 170).

Looking first at the term traditional ecological knowledge, it is suggested that traditional forms of ecological knowledge are important in understanding how to better conserve natural resources and protected areas, and that if development takes place before we can fully understand these types of traditional livelihoods, our ability to do so may be greatly hindered in the future (Berkes 2008: 39-40). While in this study I have explored many forms of localized ecological knowledge, with respect to agro-ecological practices and non-timber forest product collection, I have chosen to move away from Berkes' use of the term traditional due to its temporal implications. Still, concepts described by Berkes and others are highly applicable to this study. To this end, having a background in both environmental sciences and anthropology, I additionally believe that as outsiders, it is most important to gain a deeper and better understanding into how the communities and cultures we are studying relate to their surroundings. This idea ties into the concerns of some political ecologists as described by Forsyth (2003), that often in order to understand global environmental problems and concerns, we must understand the issues faced by and opinions of local communities as well. In other words, it is key to develop an appreciation for how communities learned or created their knowledge base surrounding their local resources and how they interact with them. Much literature is clear that we cannot make conclusions or suggestions regarding conservation and decision making without first understanding what knowledge local people already possess and how it plays into their daily lives (Berkes 2008: 39-42; Drew et al. 2006; Kempton 2001).

Turing towards to the ethnographic and theoretical works of Geertz, his ideas are also important to merits of this study in explaining the value of obtaining the opinions and ideas of local communities in China regarding their vital natural resources. As Geertz defines local knowledge, it is “practical, collective, and strongly rooted in a particular place,” and says that it is knowledge that is based highly upon the immediate experiences of local communities (1983). With respect to local knowledge, Geertz also describes it as law with respect to place, time, and space (1983: 215). This is important because for the Tibetan community in this study that relies on its own local ecological knowledge for daily livelihoods, such knowledge is key to maintaining and governing wellbeing. However the larger Chinese government would not make such a consideration when planning large infrastructural development and dams that would displace such communities, making them susceptible to socioeconomic vulnerability.

This idea of local knowledge being useful in better policy making over natural resources is further developed by Innes and Booher, who suggest that when local knowledge is held by disadvantaged or ethnic minority groups it is more likely to be ignored (2010: 172); exactly what often occurs in China between the government and ethnic minorities such as Tibetans. Additionally, the authors further point out that technical planners (like those in China) tend to become so tied up in their own fields and dilemmas that they ignore local knowledge, often to the point that major environmental and human disasters can occur (ibid: 175). This is exactly the type of outcome that has been observed on the human level with large dam building in China,

even though such projects are said to benefit local communities (Tilt et al. 2009; Zhang et al. 2008).

One of the biggest issues facing communities planned for resettlement in China is a lack of allowable public participation in decision making processes¹⁴. In direct response to such practices (though not specifically in China), Innes and Booher suggest that local knowledge and opinions must be utilized in decision making for natural resources laws and policies that will promote resilient systems (2010: 170-195).

In the authors' own words:

“We make the case for seeking out explicitly and incorporating local and other lay knowledge into planning and public processes because inclusion of such knowledge is critical, not only to social and environmental justice, but also to resilience of our systems...Local knowledge fills gaps, provides information and context, and offers pragmatic, experience-based insights from those who know a situation firsthand... Resilience requires a full range of knowledges, including those that are seldom heard.” (Innes and Booher 2010: 170-171).

With specific respect to dams and rivers, Cosens (2010) further suggests that it is only through the full and open dialogues of the many different stakeholders involved in a complex river basin system, and the continuing evolution and incorporation of such parties' views and opinions, that a truly resilient and stable system that can deal with future uncertainty can exist. These theories are, of course, only theories, and will not be immediately attainable in making informed observations and suggestions for change in an autocratic system such as China's. But they are still very useful in that

¹⁴ Despite this fact, a new law was established by China's central government that granted several very specific rights to potentially resettled communities, including more active public participation opportunities. It has yet to be determined whether or not this will actually take place (Brown and Xu 2010; PRC 2006)

they provide a strong framework for the applied values that this research is rooted within.

Where this study contributes a new piece to this theoretical framework is that literature in vulnerability theory, political ecology, and local knowledge all tell us that local communities tend to be vulnerable and underrepresented, but what we often don't know is in what way exactly? We have learned from the more theoretical side of political ecology that localized more nuanced perspectives on natural resource use are important, and also from vulnerability theory that in cases like China, local communities tend to be the most vulnerable to large development practices because of political systems. But once again we don't know where this vulnerability is most prevalent or how it presents itself within local communities, just that it exists because of the fact that they tend to be discounted. What I have thus sought to do in this study is to develop a strong economic and ethnographic methodology for understanding local natural resource use and consumption in Meilishi as a case study, knowing that hydrodevelopment and resettlement are planned for this region. In doing so, I define vulnerability as Adger does, as "the state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt" (2006: 268). Using this definition, I have sought to determine specifically how important and valuable local natural resources are to the residents of Meilishi, and then extrapolate from these results how the removal of access to them would create a "state of susceptibility to harm from social change and lack of adaptive

capacity” (ibid). Such a systematic methodological approach has yet to be presented or come to full fruition in the literature, which is where this study can then contribute.

In closing this discussion on the concept of describing and measuring vulnerability, and why local knowledge and populations are important to doing this, the anthropologist Lazrus provides one of the most poignant perspectives:

“The strong spirits of some people living in threatened environments are also like fortresses, and I am reminded of their steadfast sincerity, dignity, and vision...As much as it is social, political, and physical, vulnerability is also a matter of representation to which questions of agency are central: Who is doing the representing, under what conditions, and for what purposes?” (2009: 248)

As I previously described Chapter 1, one of my greatest motivations for completing this thesis is because of how the peoples of Yunnan, and its Tibetan communities specifically, and the rich environments around them directly interact with each other in such a rich way. The impact this has had on me over the past five years has been profound. Thus, it is out of a passion for these people and their local livelihoods that I have chosen to undertake this project, so that in some way the voices of these people about the way that they live with their natural surroundings will be brought to the table before they may no longer exist in their present form.

Chapter 4: Research Methods

This chapter provides a summary of the research methods and processes that went into this project. The research occurred in September of 2011, when I spent approximately half a month living in Meilishi village along with two research assistants in the home of one village family, with whom we interacted on a daily basis and who provided us with food and lodging. As the cornerstone of anthropological research, I utilized a primarily ethnographic approach during my time in the village, conducting a series of in depth semi-structured interviews, guided by the overarching research questions re-stated below:

- 1) What is the state and composition of the resource based economy in the village?

Specifically, how do the villagers utilize things like *chong cao* and grapes to make money, and how reliant are they on these things in order to live a quality life? If they did not receive income from one of these sources, would they be vulnerable to economic hardship?

- 2) How important is the village's location to being able to pursue and collect things like *chong cao* and grow the crops that it does?

Does the village's location make its households economically vulnerable to resettlement?

These questions were developed out of two spheres of preparation. The first being from the literature review and theory on local knowledge and vulnerability, in this case creating questions that could help to illuminate more what exactly the local knowledge is regarding natural resource use, collection, and economic importance within Meilishi. In this case the literature from political ecology and other fields has said that local knowledge of natural resources and their use is important in better

enhancing the ability to understand where vulnerability (in this case to resettlement) exists in local communities and how best to mitigate it and enhance resilience.

Secondly, I took my prior knowledge from previous visits to the region and other background literature (utilized more heavily in chapter 5) to generate questions that specifically addressed the natural resources and agricultural products in use by villagers to gather local knowledge about natural resources that was specific to Meilishi. Indeed, as I proceeded with my interviews, some of my initial interview questions did change and were adapted as I learned more about the specifics of agriculture and forest product collection among village households.

Additionally, large portions of the information that I collected during my time in Meilishi involved the use of participant observation and completely unstructured interviews with villagers as I interacted with them in their daily activities. As Bernard (2006: 354) describes, participant observation provides a useful means of triangulating ethnographic data and making the results more valid. As Meilishi is an agricultural community, and one directly tied to its local land and resources, my approach to participant observation involved participation in several agricultural activities including walnut harvests, honey harvests, some yak herding, and wild fruit collecting in the mountains above the village. I also made a regular practice during my time in Meilishi of sitting in the middle of the village every afternoon, where people would gather each day to talk, play cards, drink beer, and generally socialize. Since many of the villagers were around at this time, some of my best informal conversations in which I gained personal insights about the village economy and other aspects of daily

life occurred during these afternoons. Despite the fact that the majority of the afternoon downtime was an activity pursued by the men of the village, my participant observation activities indeed took place with a strong mix of male and female participants and informants. Often times knowing that my research assistants and I were around to talk in the afternoons, women would also come to speak with us informally, and in fact some of the most enlightening conversations about angst over the future of the grape harvest occurred during these conversations. Participation in agricultural activities similarly took place with a variety of villagers from different genders and ages, making such interactions more insightful. Indeed each gender pursued agricultural activities from a different perspective and had different observations and things to say about such practices and how they played into daily life.

Ethnographic research has a rich history of exploring environmental interactions as well as perceptions (Rappaport 1971; Scoones 1999; Zanotti et al. 2010), which made it very conducive to my study as I was specifically looking to gather local perceptions of natural resource and agricultural use, and their importance. In doing so, my goal was to specifically be able to assess the vulnerability of these resource uses to future resettlement. As Adger (2006) suggests, a combination of qualitative and quantitative data is well suited to vulnerability research because in addition to quantitative assessments, qualitative research and narratives can provide rich stakeholder and localized assessments that directly tie into a sense of place and put studies in a broader context. With this in mind, I designed my formal semi-structured interview with an integrated approach, including several qualitative

questions relating to natural resources and agricultural practices, as well as questions regarding people's perceptions on their quality of life, economic development, and a variety of other factors. Through qualitative assessment, I was also able to generate a good set of oral histories on the collection of forest products and various agricultural activities, which helped me to understand how commodities have evolved in importance over time and changed in their role within Meilishi's lifestyles and economic activities. Such oral histories covered topics such as *chong cao*, mushroom collecting, and various agricultural activities and commodities. This method of oral histories about natural resource use through qualitative interview research is one of several methods of ethnoecology highlighted by Zanotti et al. (2010).

Quantitative questions in the interviews included direct assessments of annual income amounts from various natural resources and agricultural products, to directly assess the level of importance of these various things within the village's broader economy. This method has been described as a good measure of vulnerability within agricultural communities for political economy research (Jones 2010). Quantitative assessments also involved the use of scaled questions on the importance and significance of various commodities, to help illuminate how the loss of access to such things from resettlement might make the village economy vulnerable. For example, questions asked whether a product like *chong cao* was either highly important to economic wellbeing, neutral, or unimportant. If a majority of responses indicated a high importance, this was used as a good measure of indication that a loss of access to such a resource might indicate vulnerability.

Data Collection

As previously described, my interviews were conducted during an extended half month stay in Meilishi in September of 2011. A longer stay would not have been possible without multiple interruptions due to teaching commitments. However I was very fortunate to be able to gain an emic perspective from Meilishi's villagers very quickly due to having previously visited the village in 2009, and already having a good relationship with my host family. I was assisted and accompanied in the village by two research assistants, a graduate student in Anthropology from Yunnan University, as well as a long time friend and acquaintance from Zhongdian named Ashu, who regularly interfaces between foreigners and local people as a guide and speaks many local dialects. This was incredibly valuable as many of the villagers in Meilishi, especially the elderly, did not speak Mandarin Chinese (our language of interaction), making communication difficult for myself and the other student. Already being acquainted with the father of our host family Adong, was also incredibly valuable as he was able to be an excellent informant for the study in many ways.

Indicating that we desired to interview as many of the households in the village as possible, Adong provided us with introductions to households each day who we then interviewed. In total, I conducted 20 formal semi-structured household interviews. The member of the household in each case varied based upon availability, but a mix of participants was chosen to get a variety of perspectives. Participants included household heads, their spouses, and older children over 18 who played a

large role in household functioning, as well as elders who could provide rich oral histories. A wide range of ages was also included for respondents by random sampling with the oldest being 72, the youngest 18, and many between these two. Out of the 20 interviews, an even mix of male and female respondents of ten each was included by random sample and their availability to speak with us. This provided a good mix of opinions from and ideas on the roles of both genders in village household life.

The number of 20 was chosen based upon availability of introductions from Adong of potential household interviewees, as well as content saturation, which was adequately reached with 20 (Bernard 2006). This included a large majority of the village, as according to Adong, Meilishi only has 25 households in total. Interviews were conducted in a mix of Mandarin Chinese or local dialect by my research assistant Ashu when necessary, and then directly translated into English by Ashu and my Chinese graduate assistant and transcribed on paper¹⁵. Following the interviews, transcripts were later transcribed a second time from handwritten form and typed. In addition to these formal interviews, many informal unstructured conversations took place with our host father, Adong and other villagers about a variety of topics. These along with a variety of various discoveries during participant observation were all recorded as field notes by hand and later typed.

¹⁵ Audio recording is not common practice in rural China and could have the potential to create political worries among villagers about their speaking with a foreign researcher. Therefore all interviews were recorded and transcribed on paper only.

Background on Adong

Utilizing Adong the host father as the sampling informant certainly may have formulated the study in some ways based upon his knowledge and position within the village, which warrants a short discussion of my relationship with him, his household, and their background. I first met Adong and stayed with his family for the first time in 2009 as a teaching assistant for an undergraduate field program. However I had also previously met and trekked for two weeks with other immediate members of his family as a student in 2007, and formed many close relationships with them. Adong married into Meilishi from a village very close by downstream, and his wife's brother (his brother in law) Norbu works as a travel agent and trip organizer in the prefectural capital of Zhongdian/Shangri-La. Norbu has been involved in arranging lodging, guides, transportation and other necessities for academic groups that I have been involved with for several years, and in 2009 actually arranged for a group I was helping teach to stay in Meilishi and to hike up to the *chong cao* collecting ground and yak pasture where we camped for several days with Adong as our guide. This was when I first came to know him personally, and when I approached Norbu about staying in Meilishi, possibly with his family he arranged for us to stay in his family's house with Adong as our primary host. However we were certainly treated equally well as guests by all of Adong's relatives including his wife, her sister, and their father (his father in law).

Norbu is the eldest child in the family that Adong married into in Meilishi, and he has been highly successful in his travel business as well as establishing many good

connections outside his village including various levels of social capital with local governments. To this end the entire family is quite well off and in fact one of the richer though not the richest family in Meilishi. Similarly, Adong himself is very close with the village leader who is arguably his cousin, though this may just be a colloquial term for close friend. He appears to be very well respected by all of the villagers that we interacted with, and despite being better off economically; he never hesitated to provide assistance, especially with agricultural work to multiple other households. In addition to his brother in law Norbu's success, Adong, his wife, sister in-law, and father in-law are all highly entrepreneurial and seem to have more diversified income than some of the other households in the village. His father law runs and operates one of two small village stores that sells sodas, water, cigarettes, toilet paper, and other basic necessities, and the family has also pursued other outlets for income such as bee keeping from which they market the honey they harvest.

Adong and his family's position within the village more than likely influenced the sampling for the study in that they are very well respected among the majority of the village. However with respect to the few households that we did not sample, Adong indicated that some of them were "untouchable" for whatever reason and that it was not a good idea to associate with these families. Whether this is because he did not like them is difficult to say, but the impression was certainly given to both me and my field assistants that in general these households were somewhat ostracized by the rest of the village and this was why we could not interview them. Certainly another area in which Adong's relationships with other villagers were highly influential to the

study was indeed his bringing us along with him to participate in the agricultural activities of several households who he was choosing to assist. This was very beneficial in that it allowed us to interact with other villagers and discuss various things with them in a more informal setting, but it was most certainly facilitated to a great extent by Adong's own relationships.

Data Analysis

Qualitative data from the interview transcripts were analyzed utilizing the NVivo qualitative software package (Gibbs 2002), using the theme analysis and content analysis techniques (Bernard 2006: 463-521; Hammersley and Atkinson 1995). A variety of recurring themes and thematic relationships were developed with regards to perceptions and knowledge over the use and collection of natural resources and agricultural practices as well as their importance. Themes were also developed that highlighted how villagers perceived economic development and different aspects having to do with what a quality life or life of comfort means. These being explored with specific attention paid to the possession and sale of items like *chong cao*, other forest products, and agricultural commodities. All of the thematic analyses developed were then checked for frequencies as well to see how often specific ideas, references, or ideas occurred within the sample of 20 households.

Quantitative data were first transcribed from paper interview forms and imputed into coded columns in a Microsoft Excel spreadsheet. This was then transferred as a data set into SPSS (Statistical Package for Social Sciences).

Continuous figures such as income were first analyzed descriptively through frequencies and means, to generate an overall picture of the flow of cash in village economics and how various commodities plays into this by percentage. Due to the fact that the sample size was small (20), bi-variate statistical analyses would not have been robust enough to further such analyses. Similarly, scaled questions were also analyzed based simply on the frequency of specific answers within the sample to illustrate where certainly commodities fell in importance within the perceptions of the village as a whole.

Limitations

Perhaps the greatest limitation was the amount of time available for the study, which was limited by a variety of factors including teaching responsibilities and the costs of food, lodging, field assistants, and travel to and from Meilishi. However, the limited time was fairly well mitigated by the efficiency with which the formal interviews were conducted (in 5-6 days), and Adong's ability to make this happen. During our first full day upon arriving in Meilishi, we conducted interviews with three households, and as we became more efficient with our questionnaire and how best to interpret the questions to the study subjects, we found we could easily complete four formal interviews in one day. With Adong's assistance in taking us around the village and introducing us to all of the families, we were able to complete the formal interviews quickly. This then left several days time for more informal interactions and participant observation activities, which provided some of the richest material for this study.

Chapter 5: Natural Resource Economics and Agriculture in Northwest Yunnan and Tibet

In this chapter I seek to provide an historical and current overview and background on the ethno and historical ecologies of Meilishi's primary economic sources, both agricultural and forest product based. This information can also be applied more generally to much of Northwest Yunnan, and Tibet, in terms of the economic niche that local rural populations have carved out for themselves in these areas. For the most part, this information is based upon literature reviews, though some is indeed based upon my own data collection that sought to determine some of the history behind various agricultural and forest product commodification regimes in Meilishi. The goal of this chapter is to provide detailed information on *chong cao* and other resources that are important to villagers in Meilishi. I have provided additional information on subsistence agricultural crops that have been traditionally grown and those that still are utilized in Meilishi.

Background on Harvesting and Commodification of *Chong Cao* or Caterpillar Fungus

As described by Winkler (2005 and 2008a), *chong cao* has experienced a very long history, spanning hundreds of years in both China and Tibet, with its earliest known history existing in Tibet, despite its modern day explosion as a consumer item in China. Outside Tibet and China it can also be found in surrounding regions in Nepal, India, and Bhutan, in areas also inhabited predominantly by Tibetans (Winkler 2010b). Historically it has existed as a traditional form of medicine, both in Tibet and

China, with uses varying to include use as a tonic, stamina booster, and as an aphrodisiac (ibid). Today when asked whether they actually utilize *chong cao* themselves as opposed to only collecting it as a commodity, 14 out of 20 of the households surveyed in Meilishi indicated that they did. The four uses indicated including mixing it in chicken soup, as a medicine (primarily for eye aches), mixing it with wine, and sometimes eating it, especially if it is broken when collected. These uses seem to coincide quite well with a very recent study that surveyed uses among several minority groups in Yunnan that also found Deqin's Tibetans used *chong cao* as a tonic in wine and in chicken soup to improve eyesight (Chen et al. 2010). Use as a tonic also seems to coincide quite well the historical uses of both Tibetans and Chinese as described by Winkler (2008a).

The biology of *chong cao* is incredibly strange and complex, and its name translated into English of “summer grass winter worm,” is actually quite an accurate description. *Chong cao* is the body of a caterpillar associated with various species of moths that have been parasitized by the fungus known as *Ophiocordyceps sinensis*, formerly *Cordyceps sinensis* (Boesi 2003; Winkler 2008a and 2010a). In the autumn each year, the caterpillars, which live in the high grasslands over 14,000 feet where *chong cao* is found, effectively eat the fungal spores released by the previous year's *chong cao* and then go under the ground for the winter to pupate. However after burrowing under the ground, the body of the caterpillar becomes completely parasitized and killed by the fungus which it has eaten, leaving behind only the exoskeleton. Later in the late spring and early summer, the fruiting body of the fungus

emerges out of the ground as it grows out of the former head of the caterpillar. This is the object that the local Tibetans and other collectors can be found looking for each year as they crawl across the grasslands. When collectors find one of these, they often then yell out and exclamation of excitement for all around to hear, and proceed to dig up the *chong cao* with a small hand tool very carefully so as not to break it (Winkler 2008a; personal observations 2009). In collecting areas each year, including the collecting ground above Meilishi, villagers will set up temporary living quarters in tents or small cabins in the case of Meilishi, where they remain for several weeks and spend each day combing the grasslands for *chong cao* (Winkler 2005 and 2008a; personal observations 2009). See Figures 4, 5, and 6 below for images of *chong cao* and *chong cao* collecting.



Figures 5. *Chong cao*. Figure 6. A villager with a pair of recently collected *chong cao*. According to the villagers in Meilishi, *chong cao* are always sold and marketed by pair, which is the amount for which their prices are determined.



Figure 7. The fungal fruiting body of a *chong cao* seen growing out of the soil.

In terms of trade and as a source in income, this is where *chong cao* has found its primary place among Chinese and Tibetan society. It has existed in this manner for much time as it has had a recorded use in China since as early as the 1600's (Winkler 2008a), and as it only occurs within predominantly Tibetan areas, or other parts of Western China, it is something that must be traded for. Traditionally, this trade seems to have been primarily for silk and tea, both items that the Chinese possessed and that the Tibetans needed and utilized, the trading for which was often made for with *chong cao* as it was also desired by the Chinese. This practice was indeed witnessed by western explorers who came to western China in the early twentieth century (Boesi 2003; Winkler 2005).

Yet today and over the past ten to fifteen years or so, this trade has exploded to levels never before experienced due to the economic boom that China has been

experiencing and the growth of the middle class and conspicuous consumption. Unlike previous decades, when *chong cao* could be afforded in bulk and used as a major ingredient for cooking with dishes such as chicken and duck, *chong cao* can now sell for prices equivalent to its weight in gold (The Economist 2010). It is estimated that its prices increased by 900% over eleven years from 1998 to 2007 (Winkler 2010b). Furthermore, under the guise of the aforementioned conspicuous consumption that has emerged in China, especially in places like Hong Kong in eastern China, but even abroad as well (Hugonit 2004; Róža Sulek 2009), being able to produce *chong cao* at a dinner table might “rival things like French Champagne” (Winkler 2008). Abroad as Hugonit (2004) describes, *chong cao* has even entered popular culture, being promoted as a stamina and energy enhancer by former professional basketball star Karl Malone.

However as some researchers suggest, the status of possessing *chong cao* may not be all that drives the Chinese demand for it. As something that comes from Tibet, both Lama (2007) and Róža Sulek (2009) discuss how possessing *chong cao* carries with it a sense of mysticism as something from a distant wilderness based culture. Although as Lama (ibid) also describes through a very detailed ethnography, this has also changed the relationships that Tibetans have with their sacred natural spaces. In a sense, *chong cao* has set the stage for a new form of cultural politics between Chinese and Tibetans that has forced Tibetans to invade sacred spaces they would not have previously disturbed. Thus, while as a traditionally marginalized population, *chong cao* has helped to bring Tibetans out of poverty, it has also simultaneously

marginalized them into the global economy and away from their own cultural space (Lama 2007). Interestingly, this matches one story told by a villager in Meilishi when asked about the effects of economic development on *chong cao*, though she stated she did not believe it herself:

“I have heard a story from a living Buddha who told the local people here that if you pick lots of *chong cao* there will be a bad landside in the village and that the people here would become caterpillars in their next life.”

Clearly, there may be some questioning of the cultural and religious harm of what Winkler (2008a) calls the “fungal commodification of Tibet’s rural economy” may be causing. Still, there is absolutely no doubt that over the past few decades *chong cao* has become extremely important to Tibetans across the region as a primary source of income, and as Winkler (2005) points out, it is one of the few industries from which rural Tibetans can directly collect income themselves, versus other industries being developed in the region such as logging, hydropower development, and mining. Additionally, with respect to Yunnan, while the small region in the province where *chong cao* is found produces a relatively small amount compared to other regions of China, such as the Tibetan Autonomous Region and Qinghai Province, this is because the amount land where it is found is small. Still, Yunnan alone produces annual amounts equal to the entire country of Nepal, only slightly less than India, and almost double what comes from Bhutan, making Yunnan is quite important for *chong cao* production (Winkler 2010b). With respect to Yunnan’s Tibetans, as later chapters will show, Meilishi is one rural community in Yunnan for which *chong cao* is indeed extremely valuable and important, as its value has continued to increase

just as it has across the Tibetan Region, making Meilishi's location and access to areas where it can be collected equally important.

As the several villagers themselves told me, Meilishi is one of only a few villages in its region that has access to a collecting ground for *chong cao*, which many of the villagers also stated they believe makes Meilishi one of the best villages to live in in the area. As my host father Adong also told me during two informal discussions, Meilishi in fact has access to two areas where *chong cao* can be collected each year. He also explained that there is another village in the area without *chong cao* access that pays Meilishi 100 RMB¹⁶ per person per month each year to share the collecting grounds with Meilishi's villagers. Interviews with predominantly elderly villagers in Meilishi also provided some insight into *chong cao*'s historical timeline in the village as well. It seems that it has been collected as far back as the 1960's (at least this is the earliest that anyone could remember collecting it), and was sold at very cheap prices at that time as well, selling at 12 RMB per *jin*¹⁷ according to one respondent, or 1 RMB for four or five pairs according to two others.

Current *Chong Cao* Harvesting in Yunnan and Meilishi

Today, the current marketing of *chong cao* in Meilishi based upon my own household surveys and informal interviews varies from household to household, but one consistent fact is that each household sells the *chong cao* that it collects individually and travels to various locations to do so. The majority of the twenty

¹⁶ 1 RMB is approximately 6.3 U.S. dollars.

¹⁷ 1 *jin* is approximately 500 grams.

households surveyed indicated that they simply travel to the county seat in Deqin to market what is collected. However two households indicated that they went further away to skip go between levels in the market and make more money by selling directly to higher levels marketers. Of these two families, one indicated that the annually travel to Lhasa, the capitol of the Tibetan Autonomous Region where prices were said to be higher. The other household indicated that they had a daughter who was going to university in the provincial capital of Kunming, and that they would wait to send whatever *chong cao* they collected with her to sell directly to medicine markets in the city.

In terms of prices, some households provided a range of prices, indicating that the best pairs of *chong cao* (larger in size) could be sold for as much as 120 RMB, while the smallest less desirable pairs could sell for as little as 50 RMB. Some households only provided a single current price however, the average among the 17 households who could provide prices being 66 RMB per pair. The average price 5 years ago between 14 households being 31.5 RMB, 5 years ago from 12 households 14 RMB, during the 1990's from six surveys 3 RMB, and during the 1980's from ten surveys producing an average price of 2 RMB. Clearly, commodification has occurred which is certainly consistent with trends across China for *chong cao*.

With respect to distribution and use in Yunnan, *chong cao* is restricted to the northwest region and is only found in isolated pockets of high elevation grassland, typically around 14,000 ft. This is why Yunnan's total contribution to the overall annual production of *chong cao* is low compared to other regions, because provinces

such as Qinghai and the Tibetan Autonomous Region simply possess much more habitat. In Deqin County, *chong cao* is found in two primary areas, on Kawa Kharpo, where Meilishi and a few other villages collect it, and also further southeast across the Lancang, in areas on the Baima Snow Mountain range (Olsgard Stewart 2009; Winkler 2010a). In both of these areas it is primarily Tibetans who collect and market *chong cao*, while in areas further south on the Lancang and also to the southeast on the Jinsha, it is also found in small populations where it is collected sold, and used to some extent by other minority groups including the Bai, Naxi, and Lisu (Chen et al. 2010; personal observations 2009). Additionally, a new species, *Ophiocordyceps laojunshanensis* that grows at lower elevations in mossy areas has recently been discovered in the Laojun Mountains on the Jinsha, a predominantly Lisu, Bai, Yi, and Naxi minority area (Chen et al. 2011).

Matsutake, other Mushrooms, and Non-Timber Forest Products

In addition to *chong cao*, Meilishi's households and the majority of the villages in the region also engage in the collection of other fungi and non-timber forest products as a primary economic strategy. Regionally (though not in Meilishi where my research showed it was a second tier income source), *matsutake* is by far one of the biggest sources of rural household income, contributing 50-80% according to Yang et al. (2008), or 25-30% according to Menzies and Li (2010). In either case, *matsutake* is big business in Northwest Yunnan, and as Winkler (2008b) points out, in the greater picture of things, *matsutake* is overall far more important in Yunnan than *chong cao*.

because it grows in lower elevation oak forest habitats, of which Yunnan possess a large abundance. Additionally, it has only continued to increase in importance since 2008 when the government banned commercial logging, which was said to have been the most important source of income locally (Menzies and Li 2010; Yang et al. 2008; Yeh 2000).

Matsutake translates as “pine mushroom” (Yang et al. 2008) in Japanese, and personal consumption certainly exists in Yunnan of these mushrooms and most likely has for much time among the local people. However the greatest use of *matsutake* in Yunnan is as an export to Japan, making it one the province’s greatest revenue producing agricultural or forest products (Yang et al. 2008). But this demand as with *chong cao* is a relatively recent phenomenon. In 1985, less than 20 tons were exported to Japan annually, while in 2005, twenty years later, these numbers reached 1,420 tons according to Menzies and Li (2010), or 1,300 metric tons generating over 44 million U.S. dollars according to Yang et al. (2008). Diqing Prefecture specifically, where Meilishi is located, is said to provide 47 percent of Yunnan’s *matsutake*, making it by far the most important location for mushroom’s collection (Yang et al. 2008). In 2005, when Yunnan produced 1,300 tons of *matsutake* for export, Diqing produced almost half of this, with 611 tons (Winkler 2008b).

Despite this recent history of commodification, one of the biggest issues surrounding *matsutake* collection is very unstable prices, due to the fact that Japan can get *matsutake* from several other regions and countries. In a sense, demand and prices are only higher at times when the Japanese are specifically more reliant on Yunnan’s

matsutake, which can vary from one season to another when the mushroom may or may not be ripe in other regions (Menzies and Li 2010; Yang et al. 2008). Also of issue is access to collecting areas, which can be heavily guarded between one village and another. Specially, villages that don't possess areas where *matsutake* can be found have shown a propensity to attempt to enter regions inhabited by other villages; leading to a significant level of conflict (Yeh 2000). As Yeh explains, this seems to be particularly driven by the rising prices of *matsutake* and a desire by rural people to be able to partake in its collection and marketing (2000).

With respect to marketing, *matsutake* moves from Yunnan to Japan very rapidly, within 40-50 hours according to Yeh (2000) and in within 48 hours according to Yang et al. (2008). This occurs through a series of intermediaries, and at the village level as I was able to observe in Meilishi, what occurs is a buyer will come to the village on specific days in the evening to purchase all of that day's collection. This is done through two processes, first determining the quality of the mushrooms, which can include three or four tiers, and then by weight in Chinese *jin*. Once this is done, the collector is paid. In the case of Meilishi, as I was informed by Adong as we observed an evening *matsutake* market, the buyer will take the mushrooms to the county seat in Deqin and then sell them to another buyer who will take them straight to the provincial capital in Kunming. There they will then be sold again and shipped to Japan or sold in local markets. This seems to correlate with the information provided by Yang et al. (2008) as well. Of course there are some mushrooms which are kept by the villagers themselves for personal consumption. As I observed, these

are typically of the lowest quality, and additionally a majority of these mushrooms are dried by villagers so that they can be preserved for future use.

In Meilishi, while some villagers do collect *matsutake* it is clearly not as important as *chong cao*. Only 14 out of 20 households indicated that they collected it, versus 17 households who said they collected *chong cao*, and of these 14 households, all but one indicated that the money they make from *matsutake* is significantly less than that made from *chong cao*. Interestingly however, out of all 20 households surveyed, 6 indicated that other mushrooms and forest products were more important to them as a source of income than *chong cao*. This is interesting to note as none of the income figures given by these respondents seem to agree with this assertion. I will discuss these specific figures in much more detail in Chapter 6.

During my informal talk with Adong during the evening *matsutake* market, I also learned a lot of interesting information specific to Meilishi's harvest of this mushroom as follows. At this time, the villagers who were collecting were finding 3-5 *jin* per day, but could collect as much as 7 *jin* on a good day. This year the lowest quality mushrooms were selling for 30 RMB per *jin*, medium quality for 50 RMB, and the absolute best for 70 RMB. However Adong also indicated that they can also sell for a little as 10 RMB or as much as 100 RMB per *jin*. It looked as if in one day the whole village had collected about 70 *jin*, with the most earned by one person being 450 RMB that day. With only 70 *jin* collected, this was a low day for the village, as Adong indicated they can typically bring in between 200 and 300 *jin* in one day. One fun story worth describing from this experience was just as the marketer was leaving,

a mute villager showed up who only communicated price by numbers held up by fingers. When he gave his day's take to the marketer who then weighed it, the man was then paid 350 RMB, and gave an absolutely huge smile to show his excitement. See the evening *matsutake* market in Meilishi in Figures 8 and 9 below.



Figure 8. Villagers present their *matsutake* to the marketer to be weighed and priced.



Figure 9. *Matsutake* are separated by the marketer's assistants into three different qualities.

Within Meilishi and the surrounding area, villagers also engage in the collection of other mushrooms and non-timber forest products, but these are even lower tiered as income sources than *matsutake*. Only nine out of the twenty households surveyed in Meilishi indicated that they even partook in such collection, and in all but one case the amounts of income reported from these things were far less than those reported for *chong cao*. Though in some cases did rival the amounts reported for *matsutake*.

Other than *matsutake*, probably one of the more important things collected for income in the region are morel mushrooms, not as lucrative but still a solid supplementary source of revenue. As Winkler (2010c) describes, while traveling in a Tibetan section of Northwest Yunnan, he happened to come upon a group of Tibetan women on the side of the road who had just spent the day each collecting several pounds of morels. As it turned out, the women had done their collecting while the men were simultaneously collecting *chong cao* higher up in the mountains the same day, thus each household was capitalizing on two fungi at the same time. As Winkler (ibid) further describes, in Northwest Yunnan, morels may provide an especially useful source of income to Tibetans because of its proximity to the capital of Kunming from where most of China's mushrooms are exported. It is further suggested that a villager might be able to make approximately 130 RMB per each per kilogram of morels collected, signifying their importance locally (ibid). Indeed villagers in Meilishi informed me that from time to time they do collect morels to sell, though they could provide much less specific information on them than they could on *matsutake*. Adong

was the only informant, who could provide specific figures on morels separate from *matsutake*, indicating that as prices fluctuate they can sell from anywhere between 600 and 1000 RMB per *jin*, and that last year he made 2000 RMB from morels.

Beyond fungi, nine of the households interviewed in Meilishi indicated that they are engaged in the collection and marketing of three other non-timber forest products. These include two herbs known as *yeju* and *beimu*, as well as the collection of wild peaches, from which the pits can be extracted and sold. *Yeju* appears to be a word mix of Yunnan dialect and Tibetan language, so it is difficult to determine exactly what this product may be in western or scientific terminology. *Beimu* on the other hand translates from Chinese as the bulb of a fritillary, a member of the lily family; the Latin name for this genus being *Fritillaria*. The collection and sale of *beimu* indeed seems to be a fairly common practice in the region, as it has also been documented as being practiced by Nu minority villagers in the neighboring Nu River valley (Yin 2001). I also witnessed Tibetans from surrounding villages collecting it in 2007. However, except in the case of Adong's household (he is part of one of the better off families and is very entrepreneurial), the amount of money made from these things is never higher than that from *chong cao* or agriculture, and averages only about 2,700 RMB per year. Still, for the families that collect these things, it does provide a nice supplemental source, and in Adong's highest case provides 24,000 RMB per year.

Cash Agriculture of Walnuts and Grapes

The development of the industry behind both grapes and walnuts as sources of income in Meilishi and the surrounding area is unique in both cases from a cultural standpoint and an economic one, both of which I will now highlight. Walnuts have a rich history in this region of Tibet, where the warm climate of the river valleys is conducive to their growth. Within the region two species are grown among the villagers, the native Chinese iron walnut (*Juglans sigilatta*), and the Persian or English walnut (*Juglans regia*), which it is suggested was introduced into Tibet from Asia Minor during the height of the animistic Bön religion prior to Buddhism (Gunn et al. 2010). Among the two species, the Persian walnut is used in the more general sense, while the Chinese iron walnut which has extremely hard shells is normally cooked for several hours and then used to extract walnut oil (ibid).

Walnuts are very important both economically and culturally to Tibetans. They are priced both as marketable items and for their medicinal and culinary properties, which in Southwest China may include use in traditional rituals, and also their mixing with the two Tibetan staples, tsampa (barley flour) and butter tea; though this does not seem to be practiced in Meilishi (Weckerle et al. 2005). Walnuts have also been an important part of trade in the region for a long time, and may have been a commodity that was shared as part of the ancient Tea Horse Trade Route that connected Yunnan, Tibet, and also India and Nepal as early as 618 AD. This route passed directly through the Lancang valley on its way to Tibet, so certainly walnuts may have played a role (Freeman and Ahmed 2011; Gunn et al. 2010).

Walnut tress themselves are also highly important, and are passed down from generation to generation with each household in a village possessing its own trees, as is the case in Meilishi (Weckerle et al. 2005). The trees are often planted close to homes as shade cover, or also as agricultural barriers and boundary markers in the fields. In some cases they are also used a shade cover next to sacred springs, which then makes the tress themselves sacred as well (Gunn et al. 2010; Weckerle et al. 2005). In Meilishi, while the tress are not typically scared, they are indeed a major part of each family's possessions, and are also indeed utilized for their shade when one wishes to take a break from working in the fields.

As Gunn et al. (2005) suggest, walnuts certainly seem to be becoming more and more a part of the developing cash economy in Deqin. In Meilishi, each family may possess anywhere from 1 to 3 trees each, and the village has also just recently planted a whole new orchard of walnut trees from which each family will get about 30 new trees or 2-3 *mu*¹⁸ of walnut land. The seedlings for this new orchard were provided by the government. Some of the original tress in Meilishi may indeed by my estimates be as old as 100 years, see Figure 10 below for an approximately 80 year old walnut tree.

With respect to the harvesting and use of walnuts in Meilishi, I was fortunate to be present in the village during the annual harvest in September (Gunn et al. 2005, say it occurs in Deqin in July and August), and was able to take part. The harvest is made with a long bamboo pole with which one climbs the trees and then proceeds to

¹⁸ 1 *mu* is approximately 1/6 of an acre.

utilize it to knock all of the nuts off of the tree and onto the ground. From here they are collected and then placed into sacks and taken back to the homes where they are laid out on the roof tops to dry. While I did not observe any villagers utilizing nuts



Figure 10. An approximately 80 year old walnut tree. This tree was planted in the mountains up above the village and is shared among all the villagers.

culturally for things like butter tea, personal consumption of the nuts is certainly a favorite past time, and quite often breaks will be taken from harvesting to simply eat some fresh nuts. To this end, the villagers quite enjoy eating the nuts fresh before they have dried, and will crack them open and then peel off the skin before eating them as the skin is still quite bitter before it dries out. After the walnuts have all been dried out,

the villagers informed me that a buyer will come to the village to which they will all sell them. According to Gunn et al. (2005), this middle man will then typically transport the walnuts either to Dali several hours to the south in Yunnan, or to Sichuan Province where they will be further marketed. In Meilishi, 19 out the 20 households surveyed indicated that they generate income from walnuts, and these amounts were all significantly lower than what is made from grapes. As Adong told me “it is still always the more the better if you can harvest walnuts,” or as another elder in the village explained: “For a rich man walnuts would not be important, but for me they are.” On average, among the 19 households who sell walnuts, the annual income was 1,800 RMB, which could however be expected to go up significantly once the new orchard reaches a nut producing stage. See Figures 11 and 12 below for examples of the walnut harvest.

With respect to the use and importance of walnuts in the greater Lancang Basin in Yunnan, survey research among several communities in the lower basin seems to indicate that they are also an important source of income (Galipeau et al. 2012). Among 843 households surveyed, at various dam construction sites including the previously discussed Xiaowan and Nuozhadu, many households indicated that they grew and sold significantly large numbers of walnuts as part of their economic strategies. These results certainly seem to suggest that similar to the Tibetan regions around Meilishi, walnuts are indeed a major crop and source of income across much of the Lancang Basin in Yunnan, and not only in the northwest (ibid).



Figures 11. The researcher carrying a bag of walnuts. Figure 12. Adong in the tree with his bamboo pole.

With respect to grapes in the region and in Meilishi, this crop is far less of a cultural symbol compared to walnuts, and indeed only first appeared in the region around 150 years ago by French introduction (Goodman 2001: 183-185; Xingyu 2010). In 1852, a French catholic missionary P re Renou arrived in Deqin and established the first church in the Lancang valley. Though Renou had been able to befriend the local Tibetan lamas, this peaceful coexistence did not last, and eventually the original churches were destroyed and priests murdered by the local lamas. However later in 1909, the Tibetans converts who had remained faithful began construction on a new church along the Lancang downstream of Meilishi in Weixi County, at Cizhong

Village. This community still exists today, and as has remained faithful to its Catholic beliefs (Goodman 2001: 183-185). At Cizhong, the priests introduced grape cultivation to the Tibetan villagers, and here they still not only grow grapes today but produce wine themselves as well, which they cellar in Cizhong's church. Cizhong and the upper Lancang where many villages now grow grapes is said to be the world's highest area in elevation where grapes are cultivated, but the warm year round climate found in the valley bottom has proved very conducive to their production. Quite interestingly as well, when a French wine expert visited the region in 1997, it was discovered that the grape variety being produced in Deqin was in fact a lost variety that had been previously killed off in France by an infestation (Xingyu 2010).

Grape growing appears to have begun much more recently in Meilishi. In 1997 the provincial brand of wine, Yunnan Red Wine arrived in markets from grapes that were primarily being produced in areas downstream on the Lancang (Xingyu 2010). However, later sometime after 2001 and the development and transformation of Zhongdian into Shangri-La, a second more local wine company was founded called the Shangri-La Red Wine company, which used the mystique and tourism surrounding the region to promote itself. There is extremely little information available on this industry, but what appears to have happened is that approximately eight to ten years ago, most likely the prefectural government in conjunction with the new wine company began to approach villages in the Lancang Valley as well as the neighboring Jinsha about growing grapes. According to the villagers in Meilishi, the government first arrived 8 years ago, and one villager who is the community leader accepted their

offer to begin growing grapes in his fields and to sell them to the Shangri-La Red Wine company. He was told that the company would pay him very good money in exchange for the grapes. For doing this the government provided the villagers with both the grape seedlings and concrete supports and wire to grow the vines on.

Following this initial introduction, over the past eight years, more and more of the village caught on to the practice, after observing how much money people were making annually by growing and selling grapes. Slowly, Meilishi's agricultural fields became completely transformed into vineyards, and two years ago the last family joined in the practice and now the entire village grows grapes. One family I interviewed has not transformed all of its fields as they raise a large number of yaks, and still require space to grow feed. In general, the villagers do not eat the grapes themselves, but they have intercropped a small number of table grape vines in with the wine grapes, which they do indeed eat, mostly as snacks, which can be nice when working in the fields.

In total, all twenty households in Meilishi that were surveyed indicated that they grow grapes, making an average annual income of 13,195 RMB, very close to the average income from *chong cao* for the village which is 10,775 RMB. Additionally, when asked what their most important source of income was, 12 of twenty households indicated grapes and *chong cao* combined, 3 indicated grapes, *chong cao* and other non-timber forest products, and 2 indicated purely grapes. Clearly over eight years, grapes have reached a very high level of importance and the villagers have come to

greatly rely on them. Something I will show in Chapter 7 has generated a huge feeling of angst and concern among many of the village households.



Figure 13. Meilishi's vineyards. Note the intercropping of corn primarily as animal feed.

Subsistence Crops and Changes in Diet

As grapes have become one of the only and primary crops grown in abundance in Meilishi, I also wish to overview what crops villagers have historically grown primarily for subsistence (and as a cash crop) and others that are still grown today in small abundance for such purposes. As seen in figure 13 above, corn is still intercropped within the grape vineyards, which was reported by villagers as being used for animal feed, though one might occasionally eat corn for personal consumption. As described in the description of Meilishi in Chapter 1, villagers may

also grow small amounts of wheat and barley within the vineyards, but this is indeed one of the major changes that had occurred in recent years with the introduction of grapes. Wheat and barley were once the staple grain crops for Meilishi, and a major part of peoples' diet, however as other cash crops including corn, and later grapes were introduced, villagers shifted their growing of wheat and barley towards cash cropping and then the purchase of rice as the staple grain for personal consumption. More or less, the traditional grains of Tibetan society that villagers once both grew and consumed have been replaced in two ways, in the fields by corn and later grapes, and on the household table by rice that is now purchased. What this means for food security today is described in more detail in Chapter 7.

As also illuminated in Chapter 1, every household does indeed also grow an abundance of fruits, vegetables and spices for personal use. Vegetables including beans, squash, peppers, tomatoes, and others are grown within the grape vineyards between the rows, while fruit trees tend to be scattered through the entire village, both in the field and around the homes. Certainly based upon my time in the village, all of these foods are also a major part of the villagers' diet, and vegetables especially will be integrated into daily meals along with the purchased rice. Thus, household produce produced in the village is certainly an important part of both diet and food security in combination with outside food purchases made with money obtained through the sale of cash crops and other commodities.

Breakdown of Various Natural Resource Income Sources

To conclude this chapter I provide a pie chart below to contextualize total annual household incomes in Meilishi, and to also show the amount of income that the various natural resources and agricultural products described in this chapter contribute to these totals. This is useful as official government statistics often only include numbers from things such as agriculture and exclude sources such as *chong cao* (Winkler, personal communication). This can be especially insightful when looking at vulnerability, as if the government excludes certain income sources, then the replacement of these may not be considered with respect to resettlement compensation.

As seen in Figure 14 below, *chong cao* and grapes make up the largest portions of each household's annual mean income at 10,775 RMB (30%) and 13,195 RMB (37%) respectively. All of the other sources combined (33%), would in total equal only slightly more than *chong cao*, and still equate to less than what is made from grapes. This clearly demonstrates the necessity of these resources, and as previously mentioned, *chong cao* is not even an officially recognized income source by the government. Current government statistics for Deqin County that report income from agricultural communities simply report grain and meat produced and nothing else, which certainly brings into question whether not only things like *chong cao* are ever considered but grapes as well, which are Meilishi's two largest income source as seen in Figure 14.

Looking more broadly at how income is distributed among the households in the village versus the aggregate mean totals shown in Figure 14, median income in

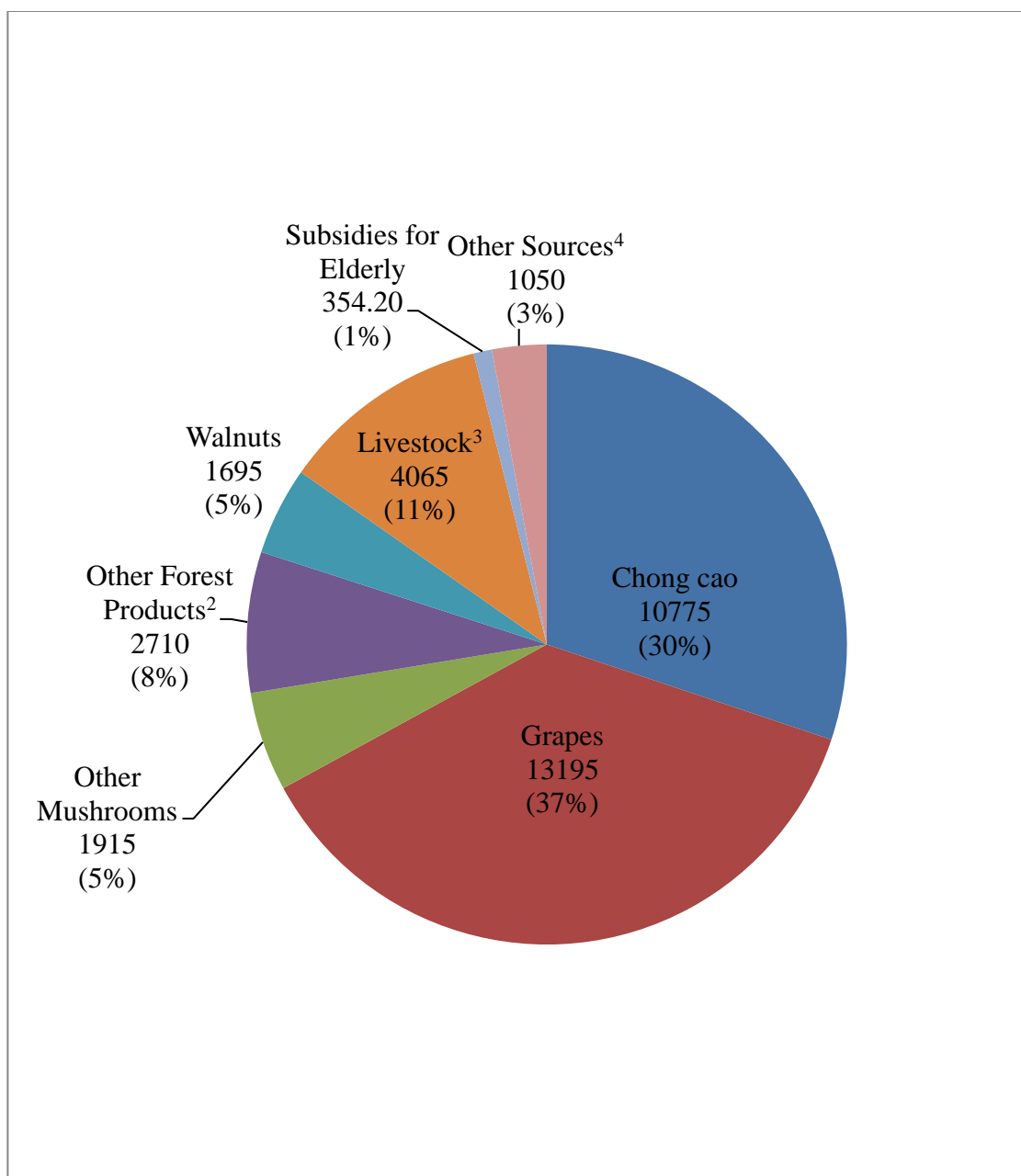


Figure 14. Mean and Percent of Total Income Sources in Meilishi¹

1. Sample size is 20 households, and means are in Chinese RMB; 1U.S. dollar is approximately 6.3 RMB.

2. Only 9 of 20 households collected other forest products.

3. Only 7 of 20 households reported income from livestock.

4. Only 3 out of 20 households reported other sources.

Meilishi was 32,150 RMB taking into account all of the components shown in Figure 14. The lowest reported household income was 17,400 RMB, and the highest reported was 81,700 RMB. The households with income that occurred at this high end of the spectrum indeed were those that engaged in a variety of entrepreneurial activities beyond standard agriculture and the collection of *chong cao* and other forest products. Two households also underreported their income, so they aren't included as a part of this range. The one household that raised a large number of yaks and *dzos* found it difficult to describe all of the income they received from selling the byproducts and the household that was clearly the richest in the village by observing their home and possessions, vastly underreported their income at only 16,600 RMB. This was suggested to me by Ashu based on his experiences in similar situations, mostly likely due to the fact that the son in the family was closely connected to the government and likely didn't want to report income because some of his dealings might be suspicious of even corrupt. Without having completed a comparative study among several communities in the upper Lancang it is difficult to say whether or this range of income or median would be average within the region, however survey data from agricultural households in the lower Lancang (Galipeau et al. 2012), does compare well with the data I received in Meilishi both on the low and the high end.

Chapter 6: Socio-Economic Strategies and Vulnerabilities to Resettlement

This chapter discusses the results of the semi-structured household interviews and other unstructured interviews to illustrate villagers' dependence upon resources such as *chong cao*. In highlighting these results, the argument I make is that Meilishi's economy is highly place based and reliant on villagers' ability to take part in specific economic activities. Due to the locale of the village being of such high importance, it is further suggested that Meilishi and perhaps other villages around it find themselves in a position that will make them highly vulnerable to future dam induced displacement. To illustrate this result, I begin first by highlighting village perceptions on the importance of various natural resource and agricultural commodities. I then explore results tracing the development, commodification, and increasing importance of these things as sources of income. In the last section of the chapter, I discuss how villagers expressed the location of Meilishi being incredibly important in their ability to collect and grow these various things, and how this place based economy has made them vulnerable to resettlement.

Village Perceptions on the Importance of Various Natural Resources and Cash Crops

As shown in Table 1 in the previous chapter, quantitatively, caterpillar fungus and grapes combined on average make up well over 50% of the mean household income in Meilishi. This is important to note in and of itself, but just as important with the research being couched in local knowledge, is developing an idea of what

villager perceptions were regarding the importance of these and other resources in their wellbeing. Initially I asked a qualitative question about each household's primary or highest source of annual income. These responses based upon coded themes are outlined by frequency in Table 1 below.

Table 1. Primary Sources of Income by Household Response¹

<i>Chong cao</i> and grapes	<i>Chong cao</i> , other NTFPs, and grapes	Grapes	Other	<i>Chong cao</i>
12	3	2	3	1

1. The total sample size is 20 households. Twenty-one responses are indicated as some households described a mix of sources which were coded by theme separately.

As can be clearly observed, by villagers' own perceptions, grapes and *chong cao* are by far the most important sources of income. The three "other" sources described included a pig factory owned by the home of the village leader, a village store selling local necessities, and remission from older children in one household whose sole residents were elderly, and who stated that they could no longer hike up the mountain to collect *chong cao*. The additional income strategies, such as the pig factory and store ownership as will later be described, may indeed be very sound in the future compared to other less stable sources such as *chong cao* and grapes.

Following a basic question about how villagers would overall rate the importance of various income sources, a series of scaled questions were asked about *chong cao*, other forest products, and cash agricultures to determine how respondents individually rank the importance of such commodities. In each case two questions were asked:

- A. Please rate your agreement with the following statement:
 "Chong cao is a highly important part of my livelihood."
 1.Disagree 2.Neutral 3.Agree

B. Please rate your agreement with the following statement:

“If I could not collect *chong cao* my income and livelihood would be significantly lowered or depleted.”

1. Disagree 2. Neutral 3. Agree

The same set of questions was also utilized for other forest products and cash crops, with *chong cao* simply being replaced by these terms. Quiet interestingly, in probing villagers with these questions, qualitative responses regarding feelings towards the importance of each item discussed were also given in addition to a ranking of agreement. The scaled results of these questions for all three categories are outlined in Table 2 below, with each labeled as *chong cao* A, *chong cao* B, other forest products A, etc. As the results show, in every case, no less than 70 percent of the households surveyed indicated that these natural resources and agricultural crops were both an important part of economic livelihood, and that the loss of these resources would be detrimental to well being. The *chong cao* questions produced the highest level of agreement at 100 percent and 90 percent respectively, while cash cropping came in second in agreement at 90 percent and 75 percent respectively.

As described, each of these questions tuned out to elicit various qualitative responses on the importance of each income source as well, which were coded based upon theme. Eight households described *chong cao* as being a highly important income source, giving responses such as:

“It is a very important source of income. One person can collect 15,000 RMB’s worth per year. Three people could get 45,000 RMB.”

“If my family can’t *chong cao* fungus we will have a big problem with our income and we won’t be able to buy things for the New Year.”

Table 2. Scaled Responses on the Importance of Various Natural Resource Commodities¹

Question A: Please rate your agreement with the following statement:

“*Chong cao* (or another resource) is a highly important part of my livelihood.”

Question B: Please rate your agreement with the following statement:

“If I could not collect *chong cao* (or another resource) my income and livelihood would be significantly lowered or depleted.”

Question	Disagree	Neutral	Agree
<i>Chong cao</i> A	0 (0%)	0 (0%)	20 (100%)
<i>Chong cao</i> B	2 (10%)	0 (0%)	18 (90%)
Other Forest Products A	1 (5%)	5 (25%)	14 (70%)
Other Forest Products B	4 (20%)	2 (10%)	14 (70%)
Cash Crops A	1 (5%)	1 (5%)	18 (90%)
Cash Crops B	1 (5%)	4 (20%)	15 (75%)

1. Sample size is 20 households.

“Income and health are both important because of *chong cao*.”

With 8 out of the twenty households quantifying their scaled responses for *chong cao* with statements such as these, its importance was highly stressed.

Just as they were on average shown not to be as important quantitatively in Chapter 5, other forest products did not elicit nearly as many qualifying statements as *chong cao*, with only four households providing additional assessments. Various ideas around these resources included assessments that if you’re not rich they can be as important as *chong cao*, but also that the prices of these things are not nearly as stable, making them less important. Similarly, when asked if other resources such as *matsutake* were as important as *chong cao*, 10 households (50 percent) stated yes and

10 (50 percent) stated no. However, when asked if any of these things were more important than *chong cao*, the responses were 14 no (70 percent), and only 6 yes (30 percent).

Nine households provided qualifying assessments of cash crops, (grapes and walnuts), with two primary themes, one being that grapes are more important as a source of income than walnuts, and the second theme being that income is better with grapes but that this also requires one to purchase food from outside the village, because less land is available for subsistence crops. One household when asked whether they agreed that grapes were an important part of their livelihood also stated yes, but that a high reliance is based upon the outside company who arrives every year to purchase this crop.¹⁹ Also, when asked if cash crops, and grapes specifically were considered an important source of income, 19 households (95 percent) stated yes, with only 1 (5 percent) stating no. Overall, it was clear that as far as cash cropping is concerned, grapes are far more lucrative than walnuts. However at one point during a conversation, Adong did make the assertion that having more walnuts is always better, and that every little bit helps. Indeed, the village has recently planted a whole new walnut orchard of 100 *mu*²⁰ in total, in which each family will add to their current trees. Interestingly, from conversations with both Adong and his cousin the village leader, the seedlings for this new orchard were all provided by the government.

In addition to agriculture and the collection of *chong cao* and other forest products, certain households in Meilishi participate in various other economic

¹⁹ More details on this topic in Chapter 7.

²⁰ 1 *mu* is approximately 1/6 of an acre.

activities. However, except in limited cases, these are far less integral to overall wellbeing. Some households tended to be more entrepreneurial, which may indeed come to benefit them in the long run. This was often due to surplus labor, or promotion of such activities by family members who left the village for other work or returned to suggest adding certain practices to their family's economic activities. For instance, the village leader owned a pig factory at the recommendation of his son who worked in local government. This man owned 40 pigs, and estimated that on average he made 55,000 RMB²¹ per year from their sales. Similarly, Adong's family owned one of two village shops from which they made 7,500 RMB per year. These particular types of activities were however not the normal practice, and limited to 4 or 5 families.

Perhaps one of the most interesting cases was one family who chose to raise a large number of yaks and dzos (20) opposed to the village average of only 6. The typical agropastoralist family in this part of Yunnan as described by Guo (2008), would traditionally have raised a large number of yaks closer to this number and raised grain crops mostly as animal feed. Indeed, yaks are the staple of Tibetan society, so this is not surprising. However, as other livelihood sources that provide far more lucrative returns have begun to appear such as *chong cao* and grapes, families have moved away from raising as many yaks and opted to grow more cash crops. This seems to be especially true in villages located down in the valley bottoms like Meilishi that have closer access to markets and roads, as opposed to villages higher up in the mountains (Salick et al. 2005). As expected, the family raising more yaks only

²¹ 1 U.S. dollar is approximately 6.3 RMB.

possessed about half the *mu* of grape fields as other households (an average of 4 *mu*) and must grow more wheat and corn to feed their yaks. However, because most families have opted to raise fewer yaks, they can no longer produce enough dairy products to meet their daily needs (dairy is a staple of the Tibetan diet). Thus this one family has been able to sell their milk, butter, and cheese to other households at rates that have kept them competitive in the current economy. This has especially worked well because they can indeed still supplement such sales with things like *chong cao*.

Changing Use of Natural Resource Commodities

Before highlighting the importance of Meilishi's location with respect to *chong cao* and other resources, I will briefly provide a history of its commodification and the evolution of agricultural crops as they were described to me by villagers. This will help to highlight how these things have evolved into their present level of economic importance. As discussed in Chapter 5, the earliest that any villager could remember collecting *chong cao* was in the 1960's, when they were hired by the government to do so. This is not surprising as this was still within the height of China's collective era, when all agricultural activity was controlled by the state through communes. However in the 1980's, with the introduction of the household responsibility system, the reintroduction of the smallholder system in agriculture, and the liberalization of markets (Netting 1993; Tilt 2008), it is not surprising that things like *chong cao* increased in their market importance as well. The price histories of this change from the 1980's up until today in Meilishi have already been described in Chapter 5, but as

demonstrated, *chong cao* now provides the second most important income source within the village.

Similarly, agricultural commodities have changed significantly with the introduction of open agricultural markets. However the current iteration of this change appears to be much more recent, with grapes only taking over Meilishi's fields over the past eight years as highlighted in the previous chapter. What has changed significantly however, is that the drive to produce a better profit as promised by the government with grapes, has since influenced Meilishi's villagers to even abort the production of culturally important crops. Wheat and barley much more so have historically had a very rich significance within Tibetan culture (Schmitt 2011), barley being used to make one of the Tibetan staple foods tsampa, a flour paste eaten with butter tea. However today, only 8 out of 20 households indicated that they grow both wheat and barley, and not in any significant amounts, mostly doing so for animal feed. It appears agricultural preferences for profits have overall taken over both cultural and subsistence importance, keeping Meilishi's economy place based, but one that relies heavily on outside markets²². Indeed as one village elder explained with respect to barley: "Barley used to be highly important culturally and for subsistence, but not anymore." Despite this, walnuts, which have been grown for hundreds of years, do still seem to play both a minor cultural role as well as a market based one.

²² Much more on this in the next chapter

The Importance of Meilishi's Location

In this chapter I have begun by demonstrating that *chong cao* and other forest products to a lesser extent, along with cash cropping of grapes and also to a lesser extent walnuts, are seen as highly important by Meilishi's villagers for their wellbeing. I have also utilized annual income data to demonstrate these points from a quantitative perspective. Bearing these facts in mind, I now seek to show the importance of Meilishi's location in possessing these resources, and to then utilize this information to demonstrate how the village is threatened by the perturbation of resettlement.

Village perceptions on the importance of Meilishi being located where it is are very strong. One open ended qualitative question that was asked of each household was to provide a description of what a good quality of life or standard of living meant to them. Out of the 20 households interviewed, this produced seven prevalent themes which are highlighted in Table 3 below. Of particular note are the ideas of having good income resources, and having higher income. These and other themes as well, such as good clothing and good health all tie back to having enough money to possess such things. With Meilishi's primary income sources being agriculture and *chong cao* collection, it is not difficult to imagine that access to these things would be important to attain a good standard of living. Having more money would indeed provide better food, including meat at every meal, and other additional comforts beyond these, as described by the first theme of comforts beyond *wenbao*, a Chinese concept describing basic or essential warmth and fullness. This theme was exemplified by quotes such as the following:

Table 3. Qualitative Themes for Good Standard of Living

Comforts Beyond <i>Wenbao</i>	Food to Eat/Meat at Every Meal	Good Clothing	Good Health	Having a Nice House	Having Good Income Resources	Higher Income
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“Children having money to buy biscuits at the store, young people being able to play mahjong.”

“Having everything, the more the better.”

“A higher level to all aspects of life.”

With respect to the direct importance of natural resource commodities and Meilishi’s locale, two highly relevant responses describing this ideal fell under the “having good income resources theme”:

“To have grapes and caterpillar fungus is a good standard of living. Having walnuts is also good even though the income from them is lower because they can still help with having a good life.”

“The mountain provides a good standard because most of our income comes from the mountain.”

Along these same lines, when asked to compare the standard of living in Meilishi with various other regions, including other villagers in the same region, and then areas further away such as the county town, the prefectural town, etc., a large range of responses and descriptions were given. However, the most prevalent theme, given by 10 out of 20 households, was that Meilishi indeed had a better standard of living than other villages in the same area. The primary reason for this being because Meilishi is located in close proximity to a mountain with many rich resources, including *chong cao*, something the villagers are proud of, as many villages in the area

are not as beneficially located. As two respondents stated when asked to compare the standard of living:

“It is also better here than other villages in Deqin. This is the best village because we have the high mountain with lots of resources and if we work hard we can make lots of money from the mountains.”

“It is better than other rural places and other villages around here because we have so many resources. Other villages in this area must look for work outside the village.”

This second quote brought up a major point that villagers emphasized when they described the rich resources of Meilishi: they are not forced to look for outside labor sources to fulfill their economic needs, specifically because they have *chong cao*, and to a lesser extent grapes.

As Adong emphasized during an informal discussion one evening, most villages around the Lancang in Deqin do not have access to very high pasture areas where *chong cao* can be found. Because of this, during the collecting season, Meilishi indeed allows a neighboring village to share its collecting grounds but charges 100 RMB per person per month in allowing this. Thus, not only do villagers directly benefit from being able to collect the fungus themselves, they also benefit from their possession of a collecting space which they can use as an income source.

One village elder also told me that Meilishi is known for growing the best grapes in the whole region, or at least this is what the company that buys them has told the villagers. This fact is less likely to be entirely true when one looks at other villages in the basin and the neighboring Jinsha River valley, where grapes are grown in abundance, primarily all as part of the government and Shangri-La Red Wine

Company project. Regardless of the status of the quality of its grapes, there is no doubt that Meilishi's location has been highly beneficial both for its access to *chong cao* and other forest products, as well as its ability to participate in the government introduced grape growing program. This fact presents itself both physically and in the perceptions of villagers as well.

Vulnerabilities to Resettlement

Village perceptions and socioeconomics highlight both the importance of agriculture and forest products in household economic strategies, as well as Meilishi's location as a major part of this significance. What does this then mean with respect to the research questions of whether loss of these income sources and resettlement would cause economic hardship? In the scaled questions highlighted in Table 2, a large majority of households indicated that a loss of access to these various commodities would severely impact economic wellbeing. Based upon these facts, Meilishi's economy in its current state may not be secure, and if anything is threatened merely by its geographic location, the same location that has provided villagers with such abundant resources.

As outlined in Chapter 2, Meilishi lies only just shortly upstream of the potential site for the Gushui Dam, which could become the largest dam in the entire Lancang cascade system, and indeed one of the tallest dams in the world (Magee 2011). It would flood out several communities from Meilishi to much further upstream in the Tibetan Autonomous Region. In a sense, Meilishi's proximity to

chong cao and other forest products, as well as prime agricultural space for grape growing are mere accidents of geography, yet so is the threat of its being resettled. If and when the village is resettled, it would not likely be moved to a nearby location as flat cultivatable land is highly scarce in this region, and limited to small pockets in the valley bottom. The slopes immediately above the village and within any reasonable distance upstream or downstream would provide nowhere near the space that is currently available to or needed by villagers for both their homes and farming.

As such, government resettlement practices further downstream in the Lancang Basin do not indicate that it is likely Meilishi would be relocated to a nearby location that would allow it to keep its access to things such as *chong cao*. In these areas, communities have been moved to regions with much different topography than those that they originally inhabited and have had to make significant economic and lifestyle changes. Significant alterations in cropping patterns and socio-ecological relationships, losses of localized ecological knowledge, and shifting away from agricultural income strategies to less secure forms of wage labor have all been observed (Galipeau et al. 2012; Tilt et al. 2009; Zhang et al. 2008). If such trends continue, the future of Meilishi and for that matter other villages in the area to continue in their current lifestyles may not be feasible.

Since the economic reforms of the 1980's in China, when markets were liberalized and agriculture was returned to households to grow whatever crops they wished (after meeting government grain quotas), land has been one of the most stable sources of social security and income, with the withdrawal of government social

services (Oi 1999; Tilt 2008). In Meilishi's case, land would not only refer to agricultural land, but forest land with *chong cao* and other resources as well, which is reduced in resettled households in the lower Lancang Basin by an average of 11 *mu* (Galipeau et al. 2012). If the village was relocated out of the area, there would potentially be a huge loss when one looks at the economic productivity of *chong cao*.

Interestingly, village perceptions and knowledge about this potential future are almost non-existent, and in fact many recent government programs on improving the village in its current location may be providing a false sense of security. When asked about future economic development planned for the region and for the village, only one household mentioned anything about a large dam being built and resettlement of the village. This respondent was from one of the richest households in the village, and indicated that his son was very well connected with the government through a road construction company, which is how he was aware of the future dam project. Despite this occurrence, any general knowledge of the dam and resettlement was not widespread and most villagers seemed to be completely unaware of it.

To the contrary, when asked to describe various infrastructural development projects in the village that had taken place, and that were planned for the future, respondents described a large variety of projects and events that would give the impression there are plans to continue improving the village in its current location. A range of projects were described and coded as themes, which are outlined in Tables 4 and 5 below. Some of the most prevalent projects that have all occurred recently included money between 8,000 and 10,000 RMB given out to every household for

home improvements by the local township government, seedlings for a new grove of walnuts, a new road²³, newly paved pathways throughout the village, and future plans for better irrigation canals.

Table 4. History of Development Projects

Electricity 20-40 Years Ago	New Concrete Paths Within Last Year	New hydro- electric plant (on a tributary) 2-7 Years Ago	New Road 2-3 Years Ago	Old Road from the 1960's- 70's	Piped Water 3-9 Years Ago
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Table 5. Future Development Plans

Better Landslide Prevention	Building Toilets	Continued Income for Elderly	Irrigation Canals	Sending More Children to School
More Home Improvements	Building Roads to Crop Fields	Relocation for a Dam	New Walnut Orchard	

Before exploring the ramifications of resettlement as part of future economic development and the potential projects described in Table 5 the theme of sending more children to school is worth noting as it relates to the overall feelings towards education in the village. Not only was this a prevalent theme among respondents with regards to future economic development, but many villagers including Adong often stressed the importance of education and ensuring that all of the village children could receive it. Interestingly however, due to the well off nature of Meilishi, it was never suggested that those of the younger generation should look for work far outside the region for the purposes of sending remittances home, contrary to the general trend across much of

²³ While this seems like a great thing to villagers for better transportation and market access, in many respects it may in fact simply be an indicator of improving infrastructure for future dam construction. One of the delays to dam construction in the Upper Lancang region as described by Magee (2011) has indeed been a lack of access and roads. This new road is also part of a much larger new highway system connecting Yunnan with the Tibetan Autonomous Region.

rural China. Most that had received at least a partial education and were working outside the village were doing so locally in government or tourism in various capacities, and were still close to home. The importance of education was also stressed by the fact that children cannot get any education in the village and have to travel to the county town about 1 hour or so away from primary school, and then further away as far as six hours for high school. However most village households including Adong's explained that they were dedicated to making this possible, with many indicating that children were now going to high school in the prefectural capital of Zhongdian or Shangri-La, with some now even attending university in the provincial capital of Kunming.

Returning to the ramifications of economic development as villagers expect it to occur, moving forward with projects such as those in Table 5 presents two potential issues: The first is that it may be creating a false sense of security among villagers over their current landholdings and indicating that the government plans to continue helping to improve local infrastructure. Second, from the perspective of smart economics and sound planning, continuing to spend money on such infrastructural projects beyond the building of the road (which may be needed for dam construction) does not make sense fiscally. Why are large amounts of money targeted for economic improvement being used to improve a village that officials know will be inundated in the near future? From a policy perspective, such money could be much better used preparing the village for future settlement and to generate better economic resilience and recovery strategies.

In 2006, the central government of China established a law that granted certain rights of fairness to people displaced by dams and said that the government has to be absolutely certain the standards of living of displaced people are not decreased, must remain the same, or even be raised through subsidies and post resettlement payments (Brown and Xu 2010; PRC 2006). The law, known as “Regulations on Land Acquisition Compensation and Resettlement of Migrants for Construction of Large and Medium Scale Water Conservancy and Hydropower Projects,” stated that communities reliant on agriculture must be moved to areas where they can continue to practice agriculture and must be given equal amounts of land to what they previously possessed. All trees and seedlings inundated must be compensated for, and if subsidy and compensation payments cannot offset these losses they must be increased until they do. New housing must also be provided of the same scale, standard, and function. Additionally, the law indicated that displaced people must be allowed to play a role in the decision-making process regarding their resettlement through public meetings or other activities (Brown and Xu 2010; PRC 2006). Much of the literature however, suggests that the enforcement of this resettlement law is sporadic and uneven (Brown and Xu 2010; Foster-Moore 2010; Galipeau et al. 2012; Tilt et al. 2009).

Many questions with respect to Meilishi’s future and what its future under dam induced resettlement may look like are thus enacted. Indeed, agricultural communities who are being resettled downstream on the Lancang since the law’s passing appear to receiving better subsidies from the government than communities resettled before 2006. However the subsidies that they are receiving are still minimal compared to

other new income source that must be sought out; primarily wage labor which is not nearly as stable as a means of social security compared to land (Galipeau et al. 2012). Indeed most households surveyed during various studies in the lower Lancang (resettled after 2006), reported overall less agricultural income and land possessions, especially with respect to forest land (Chen 2008; Galipeau et al. 2012).

In China, having a variety of income sources, as most in Meilishi do not, is suggested to be an indicator of less susceptibility to vulnerability of many kinds (Jalan and Ravallion 2001). Most households in Meilishi rely more strictly on agriculture of grapes, some walnuts, and forest products for their primary income. Based upon such facts, it is not difficult to imagine that were villagers moved to a new location with different topography, adapting to new agricultural technologies and methods could prove difficult as it has in other regions of China and downstream on the Lancang (Chen 2008; McDonald-Wilmsen 2009; Ponseti and López-Pujol 2006; Tilt et al. 2009; Wilmsen et al. 2011). However some households have indeed branched out, but this is limited to those families who have more educated children to make such suggestions or simply individuals who tend to be more entrepreneurial. This also seems to be highly reliant on a larger labor force within the family, which some households do not possess. Pursuing ventures such as a pig factory, a chicken factory, and various other business enterprises such as shops that diversify income appear as though they may make certain households in Meilishi more resilient to resettlement.

In addition to having to adapt to new agricultural practices and methods, a loss of forest products, and *chong cao* especially could be detrimental to Meilishi's

household economics. This is the village's second most important income source after grapes, and considering the fact that prices and demand for it show no slowing among China's middle class, it does not appear villagers' ability to make money from *chong cao* is going to diminish in the near future. *Chong cao* has provided a way for rural Tibetans across the region to adapt to and form a role for themselves within China's hyper capitalistic markets (Winkler 2008a and 2010a). Take this way from Meilishi, and based upon average household income, it is not difficult to assess the potential losses. This is further compounded by the fact that *chong cao* is not part of government calculations of annual income and census data in rural communities, which means that the inclusion of the loss of income that would be experienced could easily be left out of resettlement compensation subsidies.

Despite these indications, there is one area that Meilishi's villagers appear well adapted to cope with the socioeconomic shocks of resettlement. This is social cohesion, utilized as one of seven primary socioeconomic indicators identified and utilized by the Integrative Dam Assessment project (Brown et al. 2009; Tullos et al. 2012). During my time in Meilishi, I witnessed very strong social networks, especially with respect to the sharing of agricultural labor, which Tullos et al. (2012) identify as a very important coping mechanism for dam induced displacement in agricultural communities. Indeed, many of my participant observation activities involved taking part in the harvest of other households' walnuts each day. In doing so, I was able to witness very strong social bonds between households as they all consider

themselves to be relatives of each other²⁴. One family neighboring Adong's indeed relied heavily upon his and other villagers' assistance in the harvest and other agricultural activities as they only had one son of twelve years old or so and a father who was ill with diabetes, and could not conduct any rigorous labor anymore. This created a sense of angst and worry in the mother (that I could sense when I interviewed her), over the family's future and ability to survive off of agriculture. However when it came time to harvest, several other villagers and myself and field assistants included were happy to provide the assistance needed.

During the formal household interview with Adong, he also commented on the social harmony of life in the village and its cooperative and familial nature. This was further acknowledged by my field assistant Ashu who comes from a rural community in Northwest Yunnan as well, and tends to approach situations like ours in Meilishi like an anthropologist. One evening as we were observing a *matsutake* market in the center of the village, and watching people interact, Ashu commented how Meilishi appeared to be a very harmonious and community oriented, much like his own home village. By villagers' reports, the one area where labor sharing and networks were however not present and when households in fact pursue income and markets entirely on their own was with the collection and marketing of *chong cao*. As described in Chapter 5, each household markets their own *chong cao* and takes it wherever they wish or hope they can get the most money. There is no labor sharing in the collection

²⁴ Many may indeed be cousins as they call themselves, but I have also come to learn that in rural China this term may be used ubiquitously for close friends.

and also no sharing in the marketing of the product, which is quite contrary to most of the social networks that exist in the village, especially with respect to agriculture labor and crop marketing.

In closing this chapter and thinking about vulnerabilities to resettlement, I have several observations to summarize. The importance of cash cropping and forest products, especially *chong cao*, has been well demonstrated both quantitatively based upon income figures and also by the strong perceptions of villagers towards these things. This importance has also further increased over time as capitalist markets have developed and allowed villagers to carve out a niche for themselves as producers, collectors, and sellers of these things. However commodification and marketing such resources has reached a point of being Meilishi's only consistent and village wide source of economic output. Because of this high reliance, villagers may now find themselves in a position of significant vulnerability if they are resettled, with consequences that have the potential to be highly damaging economically. Despite this impending perturbation, there are indeed certain households who have pursued other income strategies that may help to make them less vulnerable and also strong social bonds and labor sharing networks that should help to mitigate resettlement's effects. But what else can be done or what else can occur at a community level and/or a government and policy one to make Meilishi and villages like it more resilient? This will be discussed in the conclusion in Chapter 8, with certain recommendations for a more resilient future that have come to mind based upon the results of this research.

Chapter 7: Agricultural Market Vulnerabilities

This chapter discusses a level of vulnerability that I encountered during my time in Meilishi that I did not expect to discover in planning the research. Many of my household interviews and daily interactions produced results that suggest Meilishi's agricultural income from grapes, their primary income source as highlighted in Chapters 5 and 6, is very unstable due to various issues with the marketing of this crop. This has presented itself to villagers in various ways, including concerns over food security and uneasiness about the ability to sell grapes each year due to reliance on one government sponsored factory. What is significant about these issues from an applied perspective towards policy is that while government programs of introducing more lucrative cash agricultures have been successful as a rural development mechanism, continued investment in such programs and guaranteed security of the purchase of villagers' grapes from year to year does not appear to exist. As a result, long-term economic vulnerability has developed both in terms of villagers' ability to secure economic returns from their grapes, and also with respect to their ability to purchase and secure food for subsistence. This indicates that long term vulnerability may be prevalent because there is the potential that villagers' ability to make money from grapes (one of their primary sources of incomes), may be in jeopardy, as well as their ability to use the money made from this crop to purchase food.

The Shangri-La Red Wine Company and Government Subsidized Agriculture

As described in Chapter 5, while the production of grapes in the Lancang has existed for around 150 years by introduction of missionaries, by villagers' accounts, it has only been going on in Meilishi for approximately 8 years. Around 8 years ago, the government came to the village and encouraged residents to produce grapes in replacement of other crops, indicating and providing a certain level of verbal guarantee that their income would be much higher. Over time, more and more households caught on after witnessing the increasing income that families were receiving. By most accounts, the increased income has been welcomed, and indeed grapes on average now provide more income to households than any other source.

However during the last year, and even more specifically during my time in Meilishi when the grapes were to be harvested, villagers began to voice serious concerns about their ability to sell the grapes. Harvesting season had arrived and the grapes were all ripe, but so far the company purchaser had not showed up in the village. Multiple times the company had contacted the village leader (his liaison) to indicate when and if he would be arriving, providing dates but then later canceling or simply not showing up in the village. The latest I heard when I left Meilishi was that the purchaser was to arrive in three days, but I am not aware whether or not this actually occurred. During my time in Meilishi, many villagers expressed their concern that they were losing money daily as the longer they had to wait to harvest the grapes, the more the fruit would dry out and decrease both in quality and also in weight, which is how they are sold.

Villagers have been given the impression by the government and the wine company that their grapes are important and that maybe in Meilishi they even produce some of the best grapes available. As one household elder stated: "Grapes in this village are the best in the whole region, people bring cars and come here for our grapes." However this is not likely considering the sheer volume in which grapes are grown throughout the dry river valleys of the region. In fact, the unimportance of Meilishi's grapes to the overall business of the government and its wine project may indeed be the issue at hand.

There are many explanations for what may be occurring here, and the best research into this situation would have involved being able to speak with prefectural government officials who are involved in the Shangri-La Red Wine project, as well as members of the wine company to assess its full business nature. However my level of visa approval and sponsorship for my research in Meilishi would have made such an undertaking politically risky. Still, there is much previous research and material that may help to illuminate what is occurring to cause villagers angst and create instability in their grape marketing. The Shangri-La Red Wine Company is most likely a private company with close ties to the prefectural government or even a private company that is highly subsidized for its role in promoting the idea of "Shangri-La." A culling of various Chinese internet sources seems to suggest that the Shangri-La Red Wine Company is indeed a type of joint venture between the prefectural government in Zhongdian, and investors in Hong Kong.

Much of the tourism development in Diqing Prefecture has followed this model, with privatized economic development occurring at the direct hand of the government, or what Oi (1995 and 1992) calls “local state corporatism.” Similar phenomena have also been described in agricultural systems and state interplay with farming communities as well (Li and Tilt 2007; Tilt 2008). As Li and Tilt (2007) explain, while in general the state has retreated from direct agricultural governance and decision making in China (leaving this to individual farmers), local governments still exert much influence over agriculture and its markets, especially when they play a role in local economic development.

The above referenced study by Li and Tilt also took place in Yunnan, in an area highly populated by minority groups like Diqing Prefecture, where Meilishi is located (2007). In this case, the local government became involved in sugar production as a rural economic development strategy, much like what has occurred with the production of wine in Diqing. Similarly, villages were targeted for their ability to grow sugar, and the government began to create economic incentives to encourage certain villages to become “sugar villages,” in the same way that Meilishi and other villages around it have come to grow solely grapes. This was successful to some extent; however various financial issues forced the government to privatize the publically owned sugar mill. This was done via a system of insiders, which gave the mill more financial stability but kept the sugar production highly connected to the local government, which has remained highly involved in sugar production and pricing as a means of revenue (Li and Tilt 2007).

The parallels between the sugar research of Li and Tilt (ibid) and the case of grapes in Meilishi are quite striking. Whether there may be financial issues with regards to the wine factory in Diqing are unknown, but the demand for grapes (or any other crops like the case of sugar), are highly based on market fluctuations and the ability of one government subsidized or owned company to be able to sell and market enough product to continue to need crops from village farmers. As Li and Tilt suggest, this means a high level of vulnerability for farmers, especially in the western regions of China where economic opportunities for rural people are limited. As the authors state about the case of sugar villages in their study:

“This designation of specialized sugar cane villages has created whole classes of farmers whose economic viability depends on a single cash crop with a highly uncertain future.” (ibid).

This is quite similar to the case in Meilishi, where grapes are the highest source of household income and the loss of which, especially for homes not engaged in other economic activities beyond grape production and *chong cao* collection would certainly mean economic hardship. Indeed, in some cases in the study by Li and Tilt (ibid), some farmers in designated sugar villages returned to growing other cash crops for which they made less money, but at least more than they could make at times when the government did not live up to its obligations for sugar.

In Meilishi, two households did indicate to me that if the price of grapes were to drop, or villagers were unable to sell them they could return to growing more corn as a cash crop. In this case however, the economic returns would not be near the level that villagers have come to expect from grapes over the past several years, and

economic wellbeing, especially for those who do not have as many diversified income sources could be expected to drop. As one respondent explained with respect to looking for outside labor work: “By planting grapes I can stay in the village, and decide my own life.” Similarly, villagers have come to expect a certain standard of living that grapes have brought them as an economic development tool. Under the theme of having good income resources as a standard of living previously outlined in Table 4, two households had the following to say:

“To have grapes and caterpillar fungus is a good standard of living.”

“We have professional knowledge about growing grapes, that is a good standard.”

Though only described by two households, the introduction of grape growing by the government was also described as a significant event of economic development in the village.

As Li and Tilt (2007) describe, government promotion of certain cash agricultures has brought about a certain level of economic wellbeing and expectations to Meilishi’s villagers. However, the future of this wellbeing is highly uncertain and indicates a level of vulnerability if Meilishi continues to expect that grapes will provide a certain level of income. In many ways, this is not unlike Muldavin’s (1996) political ecology critique of agricultural reform and governance in China, in which he argues that state corporatism and use of smallholder agriculture for economic development has led to the market exploitation of rural agricultural labor and resources. Certainly in the case of Meilishi, such a critique is possible, and

improvements could be made towards a more holistic use of the smallholder system.

Such suggestions will be given in the next chapter.

Ramifications for Food Security

A second issue of vulnerability experienced in growing grapes for cash markets that was raised by Meilishi's villagers was that of food security. As described in Chapter 5 prior to transforming their fields to grape vineyards, villagers grew much larger quantities of grain (primarily corn, barley, and wheat) than what they grow today. This meant that households were also far more self-sufficient in terms of feeding themselves. Yet today, with the introduction of grapes and more land being devoted to them, this is no longer the case. According to some households, grapes indeed also require them to purchase more crop inputs such as fertilizers and pesticides than they previously had to use with other crops. Continued use of such inputs also then raises questions about the continued viability and long-term sustainability of the land as production is intensified with chemicals (Tilt 2008). These various issues are described in the two following quotes from household interviews:

“Before we planted grapes we didn't have to buy corn and pesticides, but now we do. However our income is still better growing grapes.”

“If you plant grapes your income will increase, but you also have to spend more money to buy food.”

With the introduction of grapes, what has clearly occurred in Meilishi is the development of a more market oriented society with better income, but also less self sufficiency. This is further compounded by the fact that the ability to purchase

necessary grain and other food staples is completely dependent on whether or not villagers can market and sell their grapes. Something that is already problematic as described in the previous section, with respect to the reliance on the one company to do so. These issues are not isolated in China, as more and more smallholder farmers and households transition to what appear to be more lucrative cash crops over grain staples (Tilt 2008).

As Tilt (*ibid*) outlines, within China's reformed agricultural system of smallholders, created after the decollectivization of agriculture in the 1980's under the Household Responsibility System, households now tend to adapt and change their agricultural practices based on market conditions. One major reason for this is that with the withdrawal of many government subsidized social services, more income is needed, which can be provided by agricultural land and the commodity crops that it may provide. Similarly, when market conditions appear to be unstable, cropping can be diversified to ensure income stability (Tilt 2008; Veeck and Li 1996), however this is not the case in Meilishi where under government encouragement villagers have basically developed a mono-cropping system. This means that like some households in Tilt's (2008) study, families in Meilishi are almost entirely dependent on agricultural markets for both economic stability and subsistence. However in Meilishi's case, there is no crop diversification and villagers have to assume that they can make money from grapes, otherwise they cannot purchase enough food to sustain themselves.

Basically, a paradigm shift in economic development has taken place. Farmers choose to grow cash crops because this will help ensure a better standard of living over growing grain for both subsistence and marketing, due to the fact that grain prices are not nearly as high, though stable and controlled by the government. However the returns from grain, while more stable, are not nearly as lucrative and do not help to elevate one's economic wellbeing. Based upon these trends, Tilt (*ibid*) points out that in studies in other regions in the world, ensuring the long term economic (and subsistence) success of smallholders has involved a closer relationship between governments and farmers in regulating and controlling markets to ensure their stability. In Meilishi's case, such a suggestion would certainly seem prudent. Families are growing only one supposedly (according the government) cash crop are now feeling great worry both toward their reliance on one government sponsored buyer for this crop and their continued reliance on buying more grain and other food from outside sources.

The issues surrounding commodified agriculture are not unique to Meilishi or to China. In an in depth ethnographic account of coffee farmers in Oaxaca, Mexico, Jaffee (2007) describes very similar trends. Framers have chosen to grow coffee because they can make more money, however this also means that they are dependent on local marketers, known as coyotes to purchase the coffee. Similar to Meilishi, a feedback loop has developed where more coffee is grown to make more money, decreasing land for the primary subsistence crop milpa, and causing a certain level of angst and concern among the growers. They worry about how they will be able to

purchase enough food to survive and support themselves when they depend entirely upon the coyotes.

If anything, Jaffee's study when compared against the case of grape growing in Meilishi shows that globally, there are serious flaws in the ways that governments and developed regions utilize and consume the crops of rural and developing farmers and regions. This is not to say that to encourage these communities to grow grapes or coffee is a negative way to help them develop. As demonstrated in both this and previous chapters, villagers expressed to me time and time again that growing grapes has made their lives significantly better. However the ways in which they can securely procure a better living from this crop are a matter of serious concern. In Tilt's observation on other regional studies of commodity crops as an economic development tool, he points out that from a political ecology perspective, such methods have worked, but only when central governments and local farmers develop more holistic and mutually supportive relationships (Bassett 2001; Grossman 1998; Tilt 2008). Indeed, this appears to be the biggest missing element in the case of Meilishi, where villagers also asked me as an outsider who they assumed has some level of official influence, if I could help them work with the government to get better prices and market security for the grapes on an annual basis. My own thoughts on, and recommendations regarding this situation are provided in the next chapter.

Chapter 8: Conclusion

In this thesis I have examined how the villagers of Meilishi currently find themselves in a situation of socio-economic vulnerability as is threatened both by resettlement for a large hydropower project, and by various agricultural market structures. To understand these things, my approach has been to utilize the perceptions and opinions of local villagers about their various economic activities and their importance. Both in terms of valuing local opinions and ideas as important for resilience in natural resources and agricultural governance, and also from the idea of political ecology that social and political systems are an important aspect of the vulnerabilities that are occurring in Meilishi.

With respect to resettlement and the villages' economic strategies, I have shown how households are highly reliant on a specific set of natural resources and agricultural commodities, including grapes and *chong cao*. The collection and production of which are highly reliant on Meilishi's present location. Additionally, there also seems to be both an apparent lack of knowledge among villagers that their village may be planned for relocation, as well as a false sense of security created by government investments meant to develop village economics and infrastructure in its present location. The question I have then posed and will address in this conclusion is: What does this mean for the future of the village and in what ways can resilience to this future perturbation be fostered?

In terms of vulnerabilities exhibited through agricultural markets and governance methods, Meilishi's villagers have expressed a serious angst towards their

high reliance and trust in the prefectural government and its sponsored Shangri-La Red Wine Company to purchase their grapes. Several problems have arisen because of this. Villagers are inclined to continue investing in and growing grapes because they have seen the high economic return that this crop can provide and how it has elevated household livelihoods. However an ever present concern is whether or not the grapes can be sold from year to year, which causes some to consider returning to the production of corn that would have much lower economic returns. The growing of grapes has also led to an increased use of pesticides and other inputs, possibly affecting long term viability of farm land and soils. Furthermore, there is also a worry and issue of food security, as households have converted to commodity grapes in exchange for subsistence grains, forcing them to purchase these from outside sources. The ability of which to do so depends entire on their ability to sell the grapes.

Reflections on Future Hydrodevelopment

What will actually happen in Meilishi and the surrounding area with respect to hydrodevelopment is still uncertain. Dams have been proposed, and initial planning has been initiated, but beyond this there is much that is still unknown about these projects versus those further downstream on the Lancang (Magee 2011). As Magee (ibid) and Magee and McDonald (2006) suggest, development of dams on the lower Lancang is more or less a fate accompli, but this is not clear in the upper sections where Meilishi is located. Various developments in the past year may also come into play as well.

Due to the fact that the upper Lancang and Meilishi lie in the internationally designated Three Parallel Rivers UNESCO World Heritage site (UNESCO 2006), (though areas at river elevation are left out of this designation assuming the desire to build dams), a certain amount of scrutiny has occurred towards rapid construction of dams. Most recently, in July 2011, the UN committee in charge of oversight for world heritage sites expressed its continued concern over the development of dams and mines in areas adjacent to the Three Parallel Rivers World Heritage Site. In expressing this concern, a deadline of February 1, 2012 was set for China's government to submit environmental impacts assessments for all proposed projects adjacent to the site, to better assure that they will not negatively harm the cultural and biological diversity within the boundaries of the site. Specifically, UNESCO was concerned about the fact that dam construction is occurring in areas where it has not received full approval by China's central government (UNESCO 2011).

Additionally, in early 2012, China's Ministry of Environmental Protection released a new report enhancing previously established standards for the construction of dams. In this report, three minimum standards were given that it is said must not be violated: (1) No hydropower projects may be established in protected areas, (2) the projects must not interfere with people's right to a healthy living environment, and (3), projects should not interfere with the ability of a watershed ecosystem to thrive (Brody 2012). Some analysts might see these pronouncements more pessimistically, but in my mind these are reasons to think positively towards the future of Meilishi and the upper Lancang under a regime of dam induced resettlement.

The resettlement law that was passed in 2006 and is described in chapters 3 and 6 is also a reason for optimism. Admittedly, most of the literature on dam induced displacement in China focuses on the Three Gorges Region, where over 1 million people were re-located. However at the time this resettlement occurred, the 2006 law did not yet exist, and in most cases there was no place for public participation from local communities as the law now calls for. Additionally, issues and pictures of communities living destitute lives have also been described downstream on the Lancang at the first dam constructed in 1996, Manwan. Here we have come to hear about villagers searching through garbage piles simply to locate enough food to eat (Mertha 2008). Admittedly as well however, in the case of Three Gorges, China's government has since acknowledged that there have been many inexcusable social and environmental costs associated with the project despite its benefits (PRC 2011). If anything, despite the rapid pace at which hydropower is being pursued in China as a means of renewable energy in replacement of coal, a certain amount of stepping back and introspection towards how this pursuit is being done appears to be occurring.

I myself am not an opponent or proponent of hydropower so to speak, but as someone studying its potential social effects from an applied perspective, I think it is worth weighing the costs of such projects to attempt to find the most equitable outcome and benefits for as many parties as possible. Indeed, even the highly critical World Commission on Dam recognized the value that dams have had as tools of social and economic development (World Commission on Dams 2000). As three participants at a recent forum for experts and interested parties on hydropower

development in China hosted by the Integrated Dam Assessment project noted in various ways:

“Right now we are trying to develop a dialogue in China between power companies and NGOs, prior to a few years ago, there was none.”

“For a long time everyone told China you are wrong. Ok, so we will build dams. No that’s bad. We’ll subsidize renewables. No that’s bad. To provide advice rather than criticism, developing trust will be far more successful.”

“The idea of integrative basin management is lacking because there is no international standard to equalize benefits. There will always be losers and winners. However there should be a way to do hydropower development right, and if we do it right, it can be a very good thing.” (Anonymous participants)

In a broader context, what each of the above quotes exemplifies is that there really is no simple answer as to whether building dams in China (or anywhere else) is a good method of development or a negative one, but rather that the way in which this is done must be examined from a deeply critical perspective. This has been the heart of political ecology as I see it in this thesis. To examine socioeconomics and development practices in Meilishi through a critical lens, to better understand what is at stake under various environmental management and development scenarios in the future.

As I have indicated earlier in this section, such recognition has begun to occur on an official level in China as well (PRC 2011), and while the steps that have been taken in more equitable representation of all parties involved may be small, they do now exist (Brody 2012; PRC 2011; PRC 2006). Similarly, the activity and ability of localized grassroots movements and civil society have begun to play a role in hydropower and other natural resource decisions in China as well (Buesgen 2008;

Mertha 2008; Yan 2012); beginning to remove the one major barrier to resilience or level of vulnerability in China's river basins as described by McNally et al. (2009). As the authors (ibid) point out, China's political structure has actually made river basins highly resilient to hydrodevelopment on most levels (national and provincial), yet lacks such resilience and demonstrates vulnerability on the local level due to low public participation from local communities. If this is indeed changing as some indications seems to show, then there may be more time for better planning to address the social impacts of resettlement (and agricultural commodification) both in Meilishi and in similar communities worldwide.

The sense of place and local conservation ethic around the sacred mountain of Khawa Karpo at whose base Meilishi sits, and which provides the village with its rich resources, was recently threatened by mining development close by to another village on the Nu River side of the mountain (Yan 2012). Without being consulted about this, local villagers reacted, and with persistence were eventually able to convince the government to heed their opinions, ending the operation of the mine, which as the villagers saw it was indefinitely harming their local environment and resources (ibid). If this is any indication, it indeed appears that with persistence, local participation is possible in managing and developing the rivers and resources surrounding Meilishi in Northwest Yunnan, and perhaps elsewhere in similar situations. Keeping this in mind, as well as the idea described by McNally et al. (2009) that where the Lancang River may be vulnerable to hydrodevelopment is at a local community level, I now move on

to provide my specific recommendations for what actions might be taken to generate better resilience in Meilishi.

Recommendations for a Resilient Future

Arguably, the primary missing component in Meilishi's capacity to adapt to resettlement which makes it vulnerable is a lack of knowledge among villagers of this potential perturbation. As I have shown both quantitatively and qualitatively, Meilishi is highly reliant on its present location for villagers to live relatively well, and by what they themselves deem to be a good standard of living. However, this does not necessarily mean that resettlement of the village and loss of *chong cao* access and collection, along with the production of grapes would have to be detrimental, just that better enhancement of adaptive capacity among villagers is needed.

The first necessity would be to ensure that villagers play an active role in the process; something that the 2006 resettlement law stipulates is required. As the law states, villagers must be adequately informed of government plans and be allowed to play an active role through public participation and meetings (Brown and Xu 2010; PRC 2006). So far this has only happened in resettlement projects to a very limited degree, and those who have been resettled have expressed that they did not feel adequately recognized or acknowledged in the public planning process (Brown and Xu 2010). However, as I have described in this chapter, the institutional capacity of civil society in China with respect to environmental development projects indeed seems to be increasing, even in communities in Meilishi's region. This is a positive sign.

Under the law of resettlement, villagers' ability to experience a productive agricultural livelihood must also not be affected and compensation must be continuously provided for crops and trees lost until income reaches the same level that villagers currently experience. If it is not possible for the same agricultural livelihoods to be maintained, villagers must be given adequate vocational training so that they can maintain their socioeconomic status, and government subsidies must be provided continuously if this is not possible (Brown and Xu 2010; PRC 2006). This is an area of concern, as adequate subsidy provisions do not appear to have occurred in other resettlement projects downstream on the Lancang, or often rather the money for which these subsidies is intended is left in the hands of local governments to use at their own discretion (Zhang et al. 2008).

Perhaps the greatest concern that must be addressed with respect to Meilishi's resettlement is the potential loss of access to *chong cao*. While the resettlement law states that agricultural communities must not lose any source of livelihood, or have this maintained through compensation subsidies, it is not difficult to expect that this also refers only to officially reported income sources. As described in Chapter 5, *Chong cao* is not an official source of income in government calculations, so it could very easily be left out of resettlement compensation programs. With *chong cao* being one Meilishi's two primary income sources, and a highly lucrative one, this is an issue that must be adequately addressed. My specific recommendation in this respect is that villagers were very good at articulating the importance of *chong cao* to me as highly important for their wellbeing. So knowing this, if they were given free voice and the

capacity to play an active role in their resettlement, this fact could be adequately addressed. If policies are followed correctly, the loss of grapes in this case may not be as detrimental as *chong cao* however, as these are recognized as an official source of income by the local government who also relies on them (to a limited extent) for Shangri-La Red Wine.

With respect to the concerns over this industry, and the high reliance on the government and the wine company to purchase the grapes each year, I have two recommendations. The first would be to provide assistance to the village in finding other outlets to market their grapes. This is the best immediate solution, because every household has already invested large amounts of time and money in this crop, so starting over with something else would make things more difficult in the short term. I am familiar with one Swiss development NGO working in the region that has indeed expressed an interest in working with villagers to provide training and equipment for wine making, so that they may sell some wine directly to tourists themselves. This has been fairly successful as an income strategy downstream in the Tibetan Catholic village of Cizhong, where missionaries originally introduced the growing of grapes and wine making. If anything, projects such as this, if it can be undertaken, would diversify outlets and uses for grapes, alleviating some of the vulnerability of relying solely on the one government sponsored factory each year to purchase them.

The other longer term strategy would be to work with villagers to diversify their cash crops. One possibility would be to work towards more integrated growing of both grapes for the higher income that they provide, along with growing higher

amounts of corn, which as villagers told me would at least be more stable as an income source. Similarly, one could also conduct research on agricultural markets within the surrounding region to explore other cash crops that might provide the village with diversified income sources. Adapting cash crops to markets and diversifying their production has been well documented as a positive income strategy in rural China (Schmitt 2011; Tilt 2008), but one that Meilishi has not explored as much. Meilishi has been locked into grapes by the lucrative but deceiving promise of the higher income that they provide.

Broader Implications and Closing Thoughts

In thinking about the research questions for my study several things have been made clear and enlightened upon. Villagers in Meilishi are indeed highly reliant on the money produced from *chong cao*, grapes, and other resources to live a quality life, and would certainly appear to be vulnerable to economic hardship without these income sources. Second, the village's location is a highly prevalent issue; not only making it vulnerable to resettlement due to a potential lack of access to various natural resources, but also because by their own description, Meilishi's villagers in fact see themselves as living in one of the richest and most abundant villages in the area in terms of the income bearing natural resources that are available.

So what does this say about the broader global implications of Meilishi's vulnerability as a case study, and the theoretical framework that I have built upon? In general most of the vulnerability research and theory, especially that in the political ecology realm, has called for more equitable representation and understanding of local

and often ignored and marginalized populations. As Forsyth explains when describing political ecology, a more anthropocentric account of environmental vulnerability specifically looks at the social and political factors that reduce people's access to resources, and also unlike earlier environmental anthropological approaches, couches research within a global context instead of in a localized vacuum (2003). However in general, most political ecologists tend to say yes, local, especially third world communities are vulnerable, but often make this more of a generalization without explicitly highlighting where such vulnerability exists and why specifically (though some do). Similarly, vulnerability literature on hydrodevelopment says that in authoritarian situations such as China's, there is more vulnerability and less resilience on a local level (McNally et al. 2009). However once again, where is this vulnerability with respect to local natural resources exactly, how does it present itself, and in what way can it be alleviated? A gap exists here, which I intended to fill with this thesis research. Many have studied and analyzed local and "traditional" knowledge about natural resources, processes, and their management, but it seems few have translated these studies into specific definitions and analyses of where potential vulnerabilities to large scale development might exist.

This is where this study contributes, primarily from a methodological standpoint. If China's government or any government for that matter were to ask a local community about their income and livelihoods and in what ways they utilize local natural resources to live and make an income, they might be very surprised by the results. *Chong cao* for instance is something highly desired by the Chinese and

consumed by them at ridiculously high prices, however it is doubtful that any government planner involved in hydrodevelopment and resettlement would have any idea that one of Meilishi's villagers' primary income sources is actually *chong cao*. Due to the fact that this is not part of the household economic scheme that the village households are classified by. More generally, it is precisely this type of research that can help governments and other organizations find ways to better mitigate vulnerability to large economic development programs. By using the approach of this study, no pre-suppositions about the livelihoods of local villagers were made, and in fact the issues and concerns surrounding grapes came as a quite a surprise to me as a researcher.

With respect to overall quality of life, all but one household in Meilishi told me that their standard of living was better today than five years ago (the one household who said it wasn't indicated it was the same). With this being true, and with most average members of Chinese society indicating their life is better today than in previous decades, the one and only detriment to this success as I see it would be to force villages like Meilishi in China or elsewhere into a lower standard of living than what they have come to experience today. When the quality of life in even rural China has reached arguably unprecedented levels, what becomes disheartening is to see these same rural communities lose this success at the expense of further developing the nation as a whole. We have seen the negative social effects of dams and resettlement multiple times in China, but it does not mean that we have to continue to do so. As long as the building of a dam or even the development of a local wine factory to

promote tourism, can holistically take into account the opinions and values of local communities, such projects can be used as an effective means of development for the betterment of a society as a whole. In many ways, as described by McNally et al. (2009), the Lancang is an incredibly resilient socio-ecological system within China, except at the local level where institutional capacity is lacking. Thus it is my hope that in this thesis I have helped to bring this local voice to the table. To conclude, I would like to draw on the words of Cosens (2010) to further express what it means to govern a socio-ecological river basin like the Lancang in an adaptive manner for better resilience, both within society and in the ecosystem itself:

“Adaptive governance moves from a focus on efficiency and lack of overlap among jurisdictional authorities, to a focus on diversity, redundancy, and multiple levels of management that include a role for local knowledge and local action...polycentric governance would mean granting a larger voice and decision making power locally while retaining a network of state and federal government. Again, this redundancy in government, viewed as inefficient in the past, enhances the resilience of government to adapt to change.”

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