HIGH AND DRY

The cross-boundary impacts of China's Longjiang dam

Traditional ceremonial dance by Tai Mao women in the Nam Mao Valley

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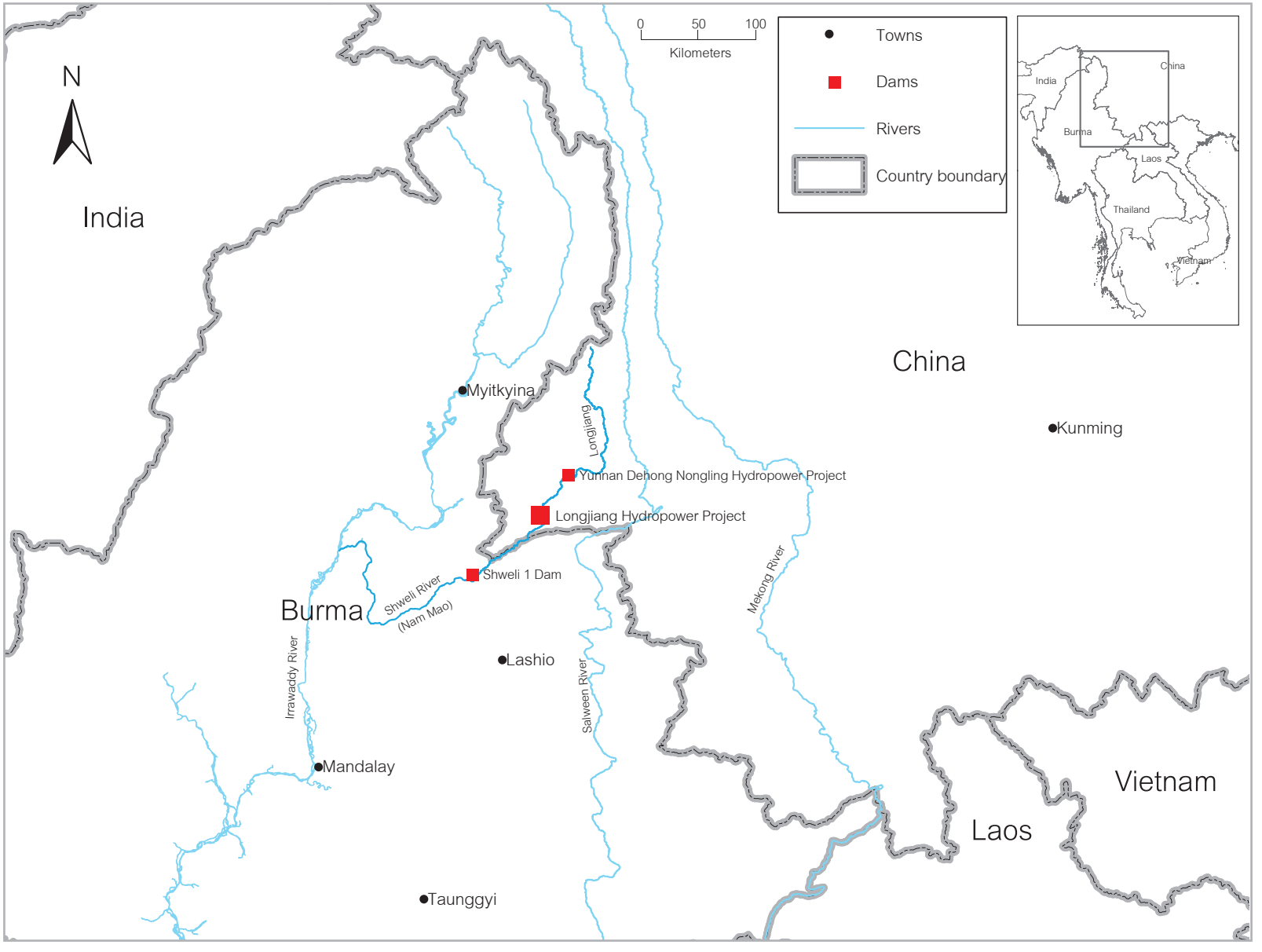
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Yunnan Dehong Nongling Hydropower Project
Longjiang Hydropower Project
Shweli 1 Dam
Shweli River
(Nam Mao)
Burma
Mekong River
Irrawaddy River
Lashio
Salween River
Mandalay
Vietnam
Laos
Taunggyi

Summary

A recently built dam on the Longjiang (Nam Mao or Shweli) river in Yunnan Province of China has severely disrupted the livelihoods of about 16,000 villagers living in the Mao Valley along the northern Shan State border in Burma.

The Ruili-Muse border crossing, in the Mao Valley, is the main border trade point between China and Burma, and local communities rely principally on income from ferrying goods across the river on either side of the crossing. However, in early 2010, when the reservoir in the Longjiang Dam started to be filled, the river dried up, falling to unprecedented low levels and bringing boats to a standstill. Since the start of the rains in May 2010, there have been huge daily fluctuations in the river levels, causing not only grounding of boats, but also flooding of goods, cutting ferry workers' incomes by up to two-thirds.

The numerous ferry operators have thus had to drastically reduce the numbers of their trips. The resulting drop in trade is not only cutting the income of the riverside communities, but also that of many of the 30,000 people living in the town of Muse, who rely on the border trade.

These communities were never informed by either Chinese or Burmese authorities about the dam and its impacts. They are urgently requesting the Chinese authorities to modify the dam’s operation so that the river’s environmental flow can be restored, and the disruption to their livelihoods minimized.

This case study provides evidence that builders of hydropower dams on transnational rivers in China have neglected to consider the trans-boundary environmental and social impacts of these projects. There is an urgent need for transparent, comprehensive and participatory assessments of the environmental and social impacts of these projects on the entire length of the rivers.

The Longjiang Dam in September 2010

Introduction

In recent years, there has been a lot of international attention focused on the trans-boundary impacts of China's dams on the Mekong/Lancang River. Communities in Burma's eastern Shan State have also been affected, and together with other impacted downstream regional networks have been seeking to raise awareness about these problems.

However, there has so far been no media coverage of the trans-boundary impacts of a new dam on another major river in China's Yunnan Province, the Longjiang River, called the Nam Mao in Shan and Shweli in Burmese.

The communities living along the Nam Mao/Shweli River in Burma have faced severe disruption to their livelihoods as a result of this dam, and requested us to document and alert stakeholders to these problems, so that they can be mitigated.

We have therefore compiled this brief report, based on interviews with affected communities conducted in August and September 2010. The report focuses mainly on the impacts to local transport systems, as this was the issue that most concerned the villagers interviewed. Further studies should be carried out to ascertain impacts in other areas, such as on fisheries and agriculture.

With many more dams planned by China on transnational rivers, including the Salween/Nu River, we hope this case study will alert downstream communities in other areas to the potential impacts of these projects, and feed into efforts by all relevant stakeholders to ensure that shared water resources are developed more equitably and sustainably.

We wish to thank all the local community members who assisted in compiling the information and photos for the report.

One river, many names

Longjiang is the Chinese name meaning "Dragon River."
Shan people call the river Nam Mao and in
Burma the river is known as the Shweli.

The Jegao Bridge over the Nam Mao/Shweli River

Trucks in Burma unload goods onto ferry boats for transport across the Nam Mao River to China

China-Burma border trade

Over 70% of Burma's trade with neighbouring countries through land-routes is with China. Most of this trade passes through the Muse-Ruili border crossing on the northern Shan State border.[1] The main exports from Burma to China are agricultural produce, including rice, beans and pulses, corn and fruit, as well as marine products, minerals and timber. Imports from China include iron, steel, construction materials, machinery and chemical fertilizers.

The main highway linking Ruili and Muse crosses the Jegao Bridge over the Nam Mao/Shweli River. However, a large proportion of the border trade does not pass over the bridge, but is ferried by small motorized boats between the villages on either side of the river. The communities living along the river have been earning a livelihood from this cross-border trade for decades.

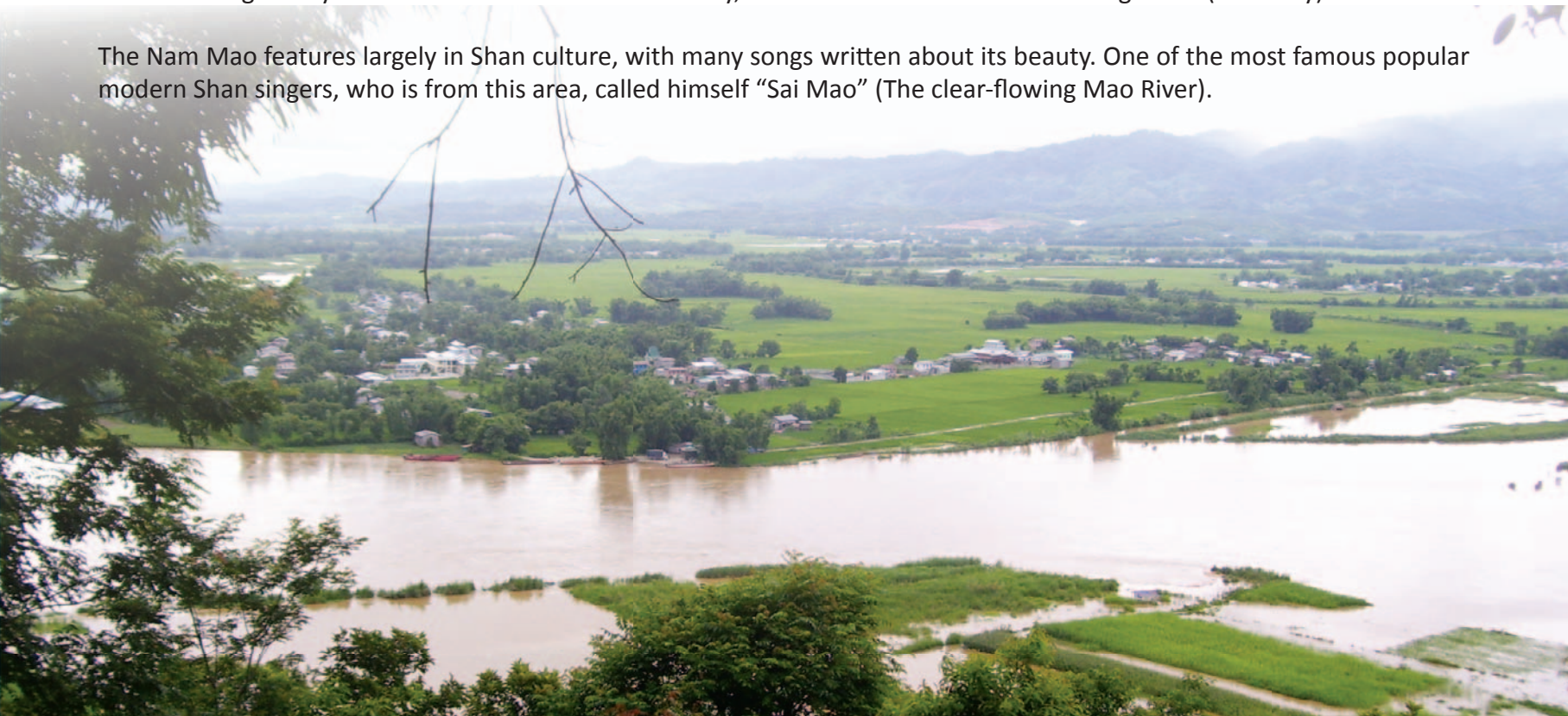
[1] "Normal Myanmar-China border trade in progress," Xinhua, July 13, 2009 at http://www.china.org.cn/international/2009-07/13/content_18126443.htm

The Longjiang/Nam Mao/Shweli River

The Longjiang (called Nam Mao in Shan and Shweli in Burmese) originates in northern Tengchong county, Baoshan Prefecture, Yunnan province. It flows for half its length through Yunnan, forming the border between Burma and China near Ruili, before flowing down through northern Shan State to join the Irrawaddy River in Sagaing Division of Burma.

The “Toong Mao” (Shweli Valley), which stretches for about 30 kms from Ruili/Shweli and Muse down to Namkham, is a rich agricultural area, mainly inhabited by Shan (Dai) villagers, who grow rice, sugar cane and water melons in the fertile plains. The Shan in this area belong to the Tai Mao sub-group, who have their own distinctive dialect, dress and customs. The Mao Valley is well-known among Shan people as the original seat of the Mao Kingdom, which stretched at its height in the 13th Century from Assam in northeast India, across through Burma, to southern Yunnan, northern Thailand and Laos, under the rule of the legendary Shan Prince Surkhanfah. To this day, Shans call the town of Ruili "Mong Mao" (Mao City).

The Nam Mao features largely in Shan culture, with many songs written about its beauty. One of the most famous popular modern Shan singers, who is from this area, called himself “Sai Mao” (The clear-flowing Mao River).



A signboard at the Shweli 1 dam warns local residents to stay away from the river bank as water levels can change at any time

Shweli Dams in Burma

The Shweli 1 Dam was completed in 2008 under Burma's first Build-Operate-Transfer hydropower agreement with China.

This 47 meter-high dam, located about 30 km from the China-Burma border, produces 600 MW of electricity, and is the first of a planned three-dam cascade that will generate some 1,420 MW of electricity, most of which will either be exported to China or used for domestic military-owned mining operations.

The Yunnan Joint Power Development Company was the main Chinese contract holder in the Shweli 1 Dam. Construction was carried out by Sinohydro Corporation.

Chinese companies are currently planning or in the process of building over 25 large dams in Burma.

The Longjiang Hydropower Project

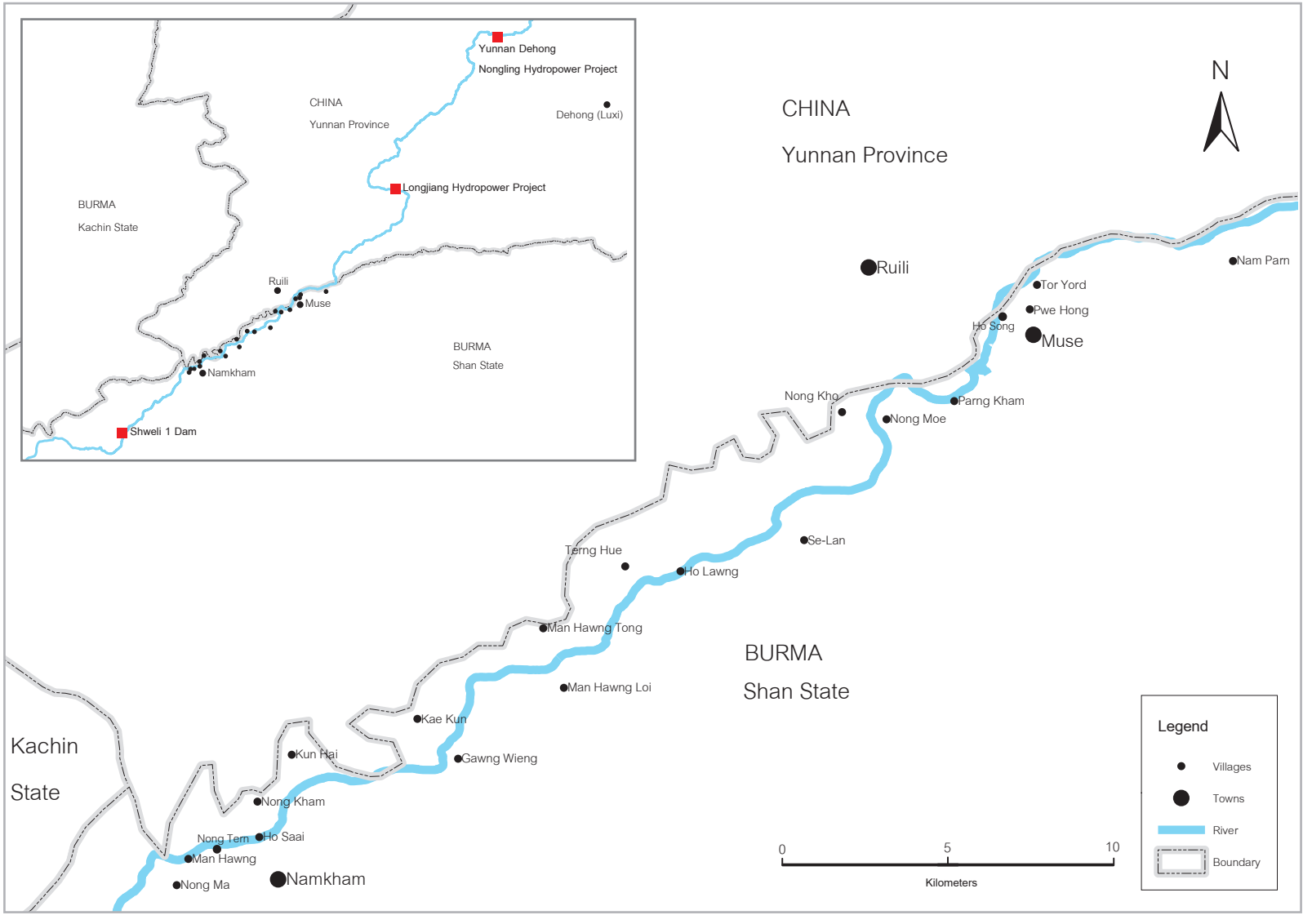
The Longjiang Hydropower Project was built by Sinohydro Corporation, China's largest hydroelectric company. It is located in Luxi County, Dehong Prefecture of Yunnan, 25 km north of Wanding on the China-Burma border. The total installed capacity of the dam is 240 MW, and the dam height is 110 m. Construction started in November 2006, and the first generating turbine began operation in July 2010. The Longjiang Hydropower Project is located about 80 kms downstream of the first dam on the Longjiang, the Yunnan Dehong Nongling Hydropower Project, which started operation two years earlier, in October 2008.

Yunnan Dehong Nongling Hydropower Project: the first dam on the Longjiang

Yunnan Dehong Nongling Hydropower Project is located near Mengyang town, Lianghe county, Dehong prefecture of Yunnan province. This 90.5 meter tall dam, completed in 2008, as a total installed capacity of 180 MW and supplies electricity to the Southern China Power Grid. The flood area of the reservoir is 8 square kilometers. The main investors include Xinhua Water Resources and Hydropower Investment Ltd., Yunnan Water Resources and Power Company, and Dehong Qinrui Power Investment and Development Ltd. There are plans to divert water from the Longjiang River above this dam to the Nu/Salween River after 2020.

The LongJiang Dam under construction in May 2010

Affected communities along the Nam Mao River



The Nam Mao ferry cooperatives

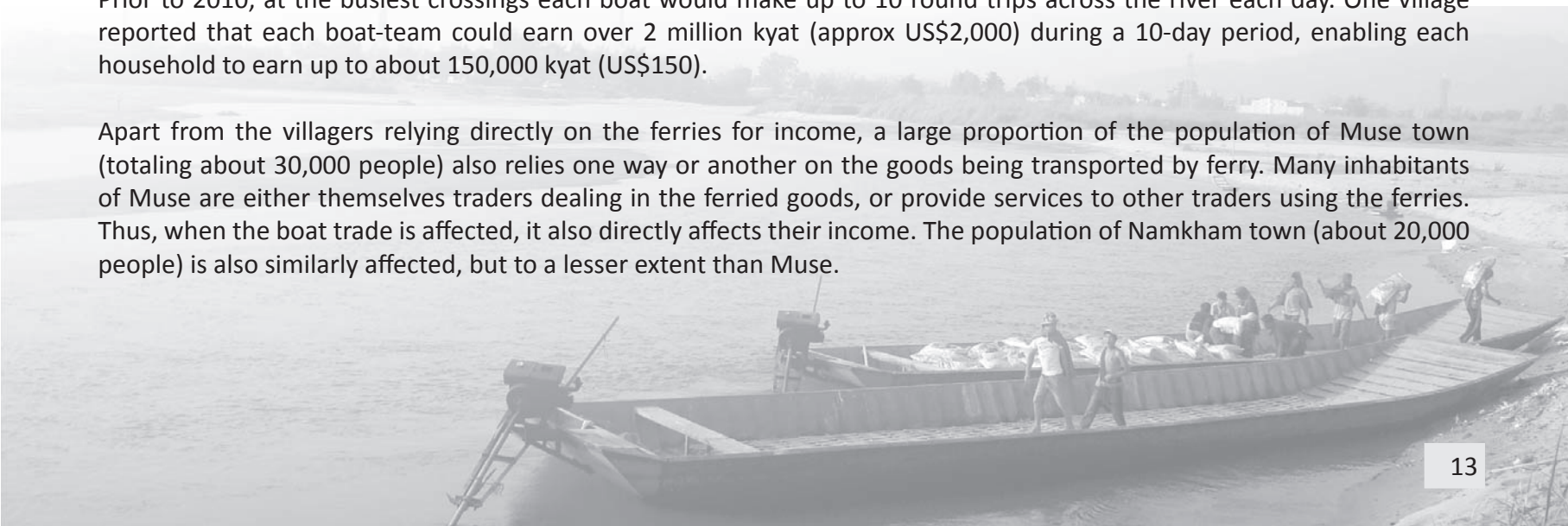
There are twenty villages on both sides of the Nam Mao/Shweli River in northern Shan State which rely directly on the ferry trade. The total estimated population of these villages is 15,750 (see Appendix). Each village operates between two to eight ferries. These flat-bottomed steel ferries, measuring about 10 meters long by 2 meters wide, are propelled by “long-tailed” outboard motors.

While local investors may own the boats, only local villagers are permitted to operate the ferries. They do this on a shift basis. For example, in one village of approximately 100 households, there are eight teams, each comprising 16 households. These teams take it in turns to operate the village’s three ferries for 10-day shifts.

The cost of transporting goods across the river is usually charged per item. For example, one sack of fertilizer may cost 140 kyat (approx US$0.14), with boats able to carry up to 250 sacks per trip, earning 35,000 kyat (approx US$35). The income from transportation of goods is shared between the boat-owners and the villagers operating the boats, with a fixed portion entering a village fund. This fund is used to maintain the piers and access roads to the river. Some of the income is also used to pay taxes to the local authorities on the Burma side to gain permission to transport goods across the river.

Prior to 2010, at the busiest crossings each boat would make up to 10 round trips across the river each day. One village reported that each boat-team could earn over 2 million kyat (approx US$2,000) during a 10-day period, enabling each household to earn up to about 150,000 kyat (US$150).

Apart from the villagers relying directly on the ferries for income, a large proportion of the population of Muse town (totaling about 30,000 people) also relies one way or another on the goods being transported by ferry. Many inhabitants of Muse are either themselves traders dealing in the ferried goods, or provide services to other traders using the ferries. Thus, when the boat trade is affected, it also directly affects their income. The population of Namkham town (about 20,000 people) is also similarly affected, but to a lesser extent than Muse.



As the reservoir began filling behind the dam as seen here in May 2010, water levels dropped to unprecedented levels downstream

Impacts of the Longjiang dam on downstream communities

The river dries up

The impacts of the upstream dams were first noticed by Mao Valley villagers during the dry season of early 2009. Water levels were lower than usual but did not significantly affect the boat traffic across the river.

The first severe impacts were felt in early 2010, when the reservoir of the second dam was starting to be filled. Starting in January, the water level in the Mao River started falling drastically. By April 2010, the river had fallen to unprecedented low levels near Muse, in some places only knee-deep. The width of the river shrank by up to 65%, leaving wide expanses of sand on both banks.

This had a drastic effect on the ferry trade. Instead of being able to load directly from the usual piers, the villagers either had to carry the goods across the sands down to the narrowed river or build new "roads" (mainly using straw and bamboo) for trucks or other vehicles to drive down to the boats.

In some places the river was not even deep enough for boats to cross, and villagers had to dig deeper channels in the river bed to enable the boats to pass. Sometimes villagers simply stepped across the boats and carried goods by hand across the river.

The lower water levels meant that the boats could not be loaded as heavily as before, in case they became grounded on the river bed. For example, instead of carrying 250 sacks of fertilizer, each boat could only carry between 50 to 100 sacks.

As a result, trade across the river slowed down significantly. Villagers reported that their income from the ferries during the dry season was halved.

> *"There is hardship when there is no water. We cannot deliver the goods quickly. We have to use more time. For example, if we earn about 2 million (kyat) in 10 days during normal time, we will get only 1 million when the water is low. Sometimes the boats cannot pass at all and we have to dig a channel in the sand for the boats and a lot of time is wasted."* (villager interviewed August 2010)

Unpredictable water fluctuations

In previous dry seasons, after the river became low, it would slowly rise again once the rains began and stay at a high level throughout the rainy season. However after the rains began in May 2010, the river level started to fluctuate unusually, sometimes several times within a single day.

> *"The water can rise and fall very rapidly. It can happen twice in only one day. On some days, at daybreak the water will be high and in the afternoon it will be very low. Then at 3 or 4 in the afternoon it will rise again. You just can't predict it."* (villager interviewed August 2010)

Villagers reported that the level of the water would fall sharply within the space of 15-30 minutes. This caused boats to be suddenly grounded mid-stream. When this happened, villagers either had to carry the goods manually from the boat to the shore, or wait for the waters to rise again.

However, if the river suddenly rose again, the waters would flood over and ruin the goods in the grounded boat.

> *"Our goods are often being flooded and ruined by the water surges. In one out of ten trips we lose our goods this way."* (villager interviewed September 2010)

The surges would also wash away the new "roads" built along the river banks, meaning that once the water fell again, the villagers had to start from scratch and build new "roads" using new materials and wasting labour.

> *"At XX village a flood came three days after they had finished the road and then they had to start all over again."* (villager interviewed August 2010)

To avoid grounding and then possible flooding from sudden upsurges of water, the villagers have been forced to stop all ferry traffic when the waters fall. This has drastically cut their earnings from the ferry trade. Villagers at one crossing point estimated that during the 2010 rainy season, they were making only a third of their usual income.

Fears of riverbank erosion

Villagers have noticed a decrease in sediment deposited on the river banks. This coupled with the sudden water surges is leading to increased erosion of the river banks.

> *"Before they built the (Longjiang) Dam, the water current was strong and used to bring sand with it. We used to dig sand (from the banks) for sale each year. Now only rocks are left. Sand does not flow to our side anymore and there is not enough sand for use."* (villager interviewed August 2010)

While stone embankments have been built to prevent erosion on the Chinese banks of the Mao River, none have been built by the authorities on the Burma side. This is in spite of the fact erosion has caused problems for some riverside villages, for example, Nam Mo village, 5 kms west of Muse, which was relocated several years ago when most of the houses and land subsided into the river.

Dam "re-operation"

There have been increasing efforts globally to carry out "re-operation" or modification of existing hydropower dams in order to restore downstream water flows as closely as possible back to a natural state, so that they can sustain healthy freshwater ecosystems and the human communities that rely on them.

One of various "re-operation" strategies involves regulating power production from dams so that water is released on a steady basis, instead of releasing water to produce power at peak energy times in the day, which causes irregular downstream water flow.

Villagers voice concerns about upstream dams

The villagers living along the Mao River in Burma have never been officially informed about the dams being built upstream in China. Most only found out about the dams after they noticed the changes in the river level. Despite the lack of exact information, they are convinced it is the dams that are causing the unprecedented fluctuations in the river.

> *"From what I heard, the dam they built is just like a big reservoir. They have a gauge to measure the water level. If there is too much water, they will release the water to the safety level. If the level is low, they will shut the sluices… If they release a lot, the level (of the river) will rise. If they release only a little, the level will fall."* (villager interviewed August 2010)

The impacts of the water fluctuations on the ferry trade are a source of serious concern for the villagers.

> *"The people of our village live, eat, and work with the Nam Mao River. Our village has about 100 households and almost all of them depend on the river for their livelihood. At present we are having a lot of difficulties. People cannot work when the water suddenly rises and falls like this."* (villager interviewed August 2010)

The villagers would like the authorities of both Burma and China to address these trans-boundary water issues.

> *"We want the military government to know we have difficulties. The authorities from China also need to come and see what is happening. What they are doing to the Nam Mao River is bringing more difficulties for villagers."* (villager interviewed August 2010)

The main demand of the villagers is for the water to be returned as far as possible to its natural flow, so that they can maintain their former livelihoods.

> *"They need to release water from the Nam Mao regularly. Not just releasing it and stopping it at will. If possible, we want our river back to the natural state it was before."* (villager interviewed August 2010)

Conclusion and recommendations

This brief study indicates that construction of dams on the Longjiang (Nam Mao or Shweli) river in Yunnan Province of China has severely disrupted the livelihoods of villagers living downstream in the Mao Valley along the northern Shan State border in Burma.

These experiences reflect those suffered by the downstream Mekong communities after the building of dams in China, and point to the urgent need for China to give greater consideration to the cross-boundary impacts of hydropower projects on transnational rivers.[2]

We are encouraged by the fact that Chinese government officials have begun to publicly state their commitment to the ecological integrity of transnational rivers, and to developing the Mekong River for the "mutual benefit" of all countries along the river.

We therefore call upon the relevant Chinese authorities:

- To immediately investigate and take measures to mitigate the adverse downstream impacts of the Longjiang dams, in particular the trans-boundary impacts of the irregular water flow on livelihoods in the Mao Valley in northern Shan State. We urge appropriate modification of the dams' operation so that the river's environmental flow can be restored, and the impacts on downstream communities minimized.

- Before implementing any further hydropower projects on transnational rivers in China, to carry out transparent, comprehensive and participatory assessments of the environmental and social impacts of these projects on the entire length of the rivers.

[2] "China says hydropower development on transnational rivers subject to ecological assessment," Xinhua, 20 May 2009 at http://news.xinhuanet.com/english/2009-05/21/content_11414683.htm and "China denies hogging Mekong River water," Bangkok Post, 12 March 2010 at http://www.bangkokpost.com/news/local/34290/china-denies-hoggingmekong-river-water

Appendix

Approximate population of villages along Mao River relying on ferry trade

Village name	Population
Ho Saai	700
Man Hawng	1,000
Nong Ma	800
Nong Kham	700
Kun Hai	1,000
Kae Kun	700
Man Hawng Tong	700
Terng Hue	700
Nong Tern	400
Nong Kho	700
Nam Parn	600
Tor Yord	450
Pwe Hong	300
Ho Song	300
Parng Kham	1,300
Se-Lan	2,500
Nong Moe	800
Ho Lawng	700
Man Hawng Loi	700
Gawng Wieng	700
Total	15,750

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Above photo: Traditional Kenneri or Bird Dance performed by Tai Mao people
Front cover photo: Unprecedented low water levels in the Nam Mao River in 2010 leave ferry boats stranded
Back cover photo: The Nam Mao River valley in Shan State

Communities living in northern Shan State of Burma have experienced drastic changes to the Longjiang/Nam Mao/ Shweli River since the Longjiang Dam was built upstream in China. This brief report compiles interviews with affected people and highlights the need for trans-boundary assessments of dams and improved management of shared water resources.

Shan Women's Action Network
Shan Sapawa Environmental Organisation