

TGP SPECIAL REPORT: Dam building in the upper Yangtze basin

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Editors' Note: Professor Chen Guojie is a senior researcher at the Chengdu-based Institute of Mountain Hazards and Environment in Sichuan province. In this special report, Professor Chen describes resettlement and environmental dangers associated with dam building in the ecologically fragile and ethnically diverse upper Yangtze region of southwestern China. He further warns that dam builders and local governments will experience greater difficulty forcing people off their land as people become more aware of their rights and of resettlement failures elsewhere.

Hydro dams everywhere

The upper reaches of the Yangtze, including the main channels of Jinsha, Dadu, Wu, Jialing and Yalong rivers, are ranked number one for hydropower potential in China.

Hydro dams are everywhere in the upper Yangtze basin. On the Xiaoshui River, for example, which is only 34 kilometres long, as many as 17 large hydro dams have been built or are under construction. Xiaoshui is a tributary of the Dadu river.

Evidently, where there is water, hydro dams will be built. Small, medium and large dams are springing up everywhere, with generating capacities ranging from several hundred kilowatts to more than 10 million kilowatts.

Table 1 below lists the number of hydro dams planned or under construction in the river valleys of the upper Yangtze.

Table 1. Hydro dams planned in the upper Yangtze basin

River	# of hydro dams planned
Main channel of the Jinsha (upper Yangtze)	21
Dadu River	17

Yalong River	21
Min River	7
Jialing River	16
Wu River	10

Upstream from the Three Gorges project, strings of dams are planned for the main channel of the Yangtze (Chuanjiang and Jinsha), tributaries such as Wu, Jialing, Dadu, Yalong and Min rivers, and sub-tributaries of the above.

Of these, 21 have an installed capacity of more than 150 MW each. The four biggest projects are on the mainstream: Wudongde, Baihetan, Xiluodu and Xiangjiaba, with a combined capacity of 38,500 MW.

For two Min tributaries, 27 dams are planned: nine on the Mabian and 18 on the Qingyi. Similarly for the Yalong tributaries, six dams are planned for the Jiulong River and 11 for the Litang.

Main challenges for dam builders and local governments

High mountains and deep gorges

Most of the hydro projects built or planned for the upper Yangtze are concentrated in high mountains and deep gorges. While it's true that these areas are less populated than other areas of the country, which keeps resettlement numbers down, the area is prone to geological disasters such as landslides, seismic activity, riverbank collapse and rock-mud flows. Resettling people onto higher and steeper ground is likely to trigger geological disasters and make erosion even worse. Knowing this, farmers forced to make way for the Pubugou dam on the Dadu River (in Hanyuan county, Sichuan province) refused to move uphill because of the poor soil conditions and lack of water. (This was reported in China Youth Daily (*Zhongguo qingnian bao*) on October 27, 2004.)

Some estimates of people displaced

- By the end of 2005, 941,000 people in Chongqing municipality had been displaced by the Three Gorges dam project. In Sichuan province, as many as 300,000 people are already on the move or will be resettled to make way for hydro projects in the near future.
- Along the Yalong River, 60,600 people were displaced by the Ertan dam.

- In the Dadu valley, 71,547 residents will be displaced by the Pubugou dam.

Ethnic minorities affected

- Within a population of 44 million in the upper Yangtze basin, there are at least 32 ethnic minority groups making up more than half the total population of minorities in China, including Yi, Miao, Tibet, Zhuang, Hui, Naxi, Lisu, Bai, Dai, and Tujia.
- In 1998, the Ertan dam displaced 46,000 people belonging to as many as 24 ethnic minorities in Miyi and Yanbian counties of Sichuan province.
- The Xiluodu dam on the Jinsha River will displace ethnic minorities in Leibo county in Sichuan province and Yongshan county in Yunnan province. In Leibo county, 52 percent of the population (207,900) are minorities such as Yi, Miao, Mongolian and Hui.

Poverty: Most people displaced by hydro dams in the upper Yangtze are living in poverty because of difficult physical conditions, poor soil, and inaccessibility. Of eight dam affected counties in Sichuan and Yunnan provinces, five are identified by the central government as poverty-stricken: Leibo, Yongshan, Yanyuan, Muli and Ganluo. Based on 2005 statistics, these counties all had a lower annual GDP per capita compared to the provincial average:

Table 2. 2004 Annual GDP per capita in five counties affected by hydro dams in the upper Yangtze basin

County/Sichuan Province	Hydro Project/River	Annual GDP per capita (US\$)
Hanyuan	Pubugou/Dadu River	600
Muli	Ertan/Yalong River	372
Ganluo	Gongzui/Ganluo River	468
Leibo	Xiluodu/Jinsha River	455
Yongshan	Xiluodu/Jinsha River	359
Average GDP per capita for Sichuan province		1,014

From past experience, we can expect that building dams and reservoirs along the upper Yangtze will make the already poor people poorer since the reservoirs will flood most of the high quality farmland and the local economy is heavily dependent on agriculture.

Land shortages

One of the biggest challenges facing people displaced by hydro dams is the shortage of land. Even without resettlement, farmland is in short supply because of the mountainous environment: steep slopes prone to erosion and geological disasters. Building dams and reservoirs makes the situation even worse because the best farmland along the valley is flooded by the rising waters behind the dams.

- In the Three Gorges reservoir area, for example, the average plot of farmland per person was only 0.86 *mu* (1*mu* =1/15 ha) before the construction of the Three Gorges dam. If the reservoir is filled to 175 metres in 2009 as planned, as much as 420,000 *mu* will be lost to the reservoir, making the situation worse.
- The Ertan dam built on the Yalong River, flooded some 29,545 *mu* of farmland, about 18 percent of total farmland in the two counties affected, Yanyuan and Mulia.
- The Pubugou dam to be built on the Dadu River, tributary of the Yangtze, submerged a total of 44,220 *mu* of farmland. Most of this land was in Hanyuan county, which amounts to a loss of more than one-tenth of the county's farmland.

Given these circumstances, it is no wonder that finding enough farmland for people displaced by dams has proven to be a huge problem for resettlement planners.

Environmental degradation

Building hydro projects in the upper Yangtze will flood farmland and forests, and disturb animals and plants as the area is disturbed by the reservoir, dam construction activities, and the building of new towns and villages to accommodate affected people. This will lead to biodiversity losses and the extinction of species.

The Jinsha and Min valleys, for example, where a number of hydro dams are in the planning and construction stages, it will be extremely hard for the natural vegetation to recover once it is disturbed. Inevitably, the construction of large-scale hydro

projects will destroy the native vegetation and with the inflow of many construction workers and new industry, the river valley will be damaged at an unprecedented rate and scale.

Ethnic conflict

Building hydro dams in the upper Yangtze involves ethnic minorities as mentioned earlier. Thus in some areas, religious and cultural issues are likely to become a difficult problem to deal with in the process of displacement and resettlement. In certain circumstances, such issues could trigger conflict between ethnic groups. In the worst case, some parties could take advantage of the dam construction to make trouble, which could lead to social disorder and tensions between ethnic groups. Therefore, governments and dam builders should be really careful when handling problems with resettlement, to avoid sensitive issues associated with religion and culture. In such circumstances, building hydro dams becomes even more difficult and costly.

In China today, people are becoming increasingly aware of their rights, to get access to information, to participate in decisions, and so forth. Obviously, increased awareness of human rights is a reflection of social progress. On the other hand, it means more complaints will be voiced by people affected by hydro dams, and more legal action will be taken to fight against wrongdoing by government officials and others. It can be anticipated that government officials and dam builders won't necessarily have the final say in the decision making process wherever locals are aware of their basic rights and are ready to fight to assert those rights. This situation is good for society as a whole, but represents a serious challenge for resettlement projects.

Conclusions

Building hydro dams in the upper Yangtze requires a great deal of land and affects a huge number of people from different ethnic groups. What makes the situation even worse is that the area is geologically complex and environmentally fragile while the local people living in the river valleys are already poor. Therefore, resettlement is a huge challenge for both local governments and dam builders.

The government's practice of resettling people affected by dams and reservoirs within the valleys has negative impacts on the development of local economies, damages the valley environment, and leads to social upheaval.

It is vital that governments and dam authorities adopt a new way of thinking about resettlement, to ensure affected people can improve their standard of living after displacement. This requires additional financial resources and support so that affected people can improve their earning capacity, as well as protect their basic rights and their environment.