

## FINAL DETERMINATION OF THE SOURCE OF THE MEKONG RIVER

One of the last great geographical mysteries of the world solved

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By international convention, the official geographic survey agency of the country in which a river source is located makes the final determination of the source. Also by international convention, the true source is the spring or glacial discharge which is furthest from the mouth of the river.

From regional maps, the Zayu is by far the longest major tributary of the Mekong, joining the Ngomqu near Qamdo in Tibet to form the Lancang Jiang or Mekong River. The two longest tributaries to the Zayu are the Zayaqu and the Zanaqu in Qinghai, China. These form the Zayu at Ganasonduo, about 100 km upstream from Zadoi.

In the July 1995 issue of *The Geographical Journal* of the Royal Geographic Society (Vol. 161 Pt. 2), the source of the Mekong River is given as 93° 52.929 E, 33° 16.534 N, elevation 4975 meters. This information is based on an expedition to the headwaters of the Zanaqu led by Michel Peissel in September, 1994.

In the October 1999 issue of *Geography*, the Chinese national geographic magazine, Zhou Changjin and Tao Baoxiang of the Commission for Integrated Survey of Natural Resources (CISNR) of the Chinese Academy of Sciences (CAS) and Guan Zhihua of the Dexiang Business Group and in the May, 2001 issue of *Geographical Research*, Zhou Changjin and Guan Zhihua of the Institute of Geographic Sciences and Natural Resources Research (IGSNRR) of CAS reported that the source of the Mekong River is 94° 41' 44" E, 33° 42' 31" N elevation 5224 meters based on a Japanese/Chinese expedition in 1994 and two Chinese and one American/Chinese expeditions in 1999 to the headwaters of the Zayaqu.

According to the CAS reports, the source of the Zayaqu is approximately 5 km further from the mouth of the Mekong River than the source of the Zanaqu. According to Zhou Changjin (personal communication), CAS is the official survey agency of the Peoples Republic of China and the location given by them is the official location of the source of the Mekong River based on international conventions.

### Background

According to his 1995 book, "The Last Barbarians - The Discovery of the Source of the

Mekong River," Peissel used 1:500,000 scale Tactical Pilot Charts (TPC G- 8D edition 1, 1989) with a contour interval of 1000 feet, available from the US Defense Mapping Agency. He measured the map distance of the Zayaqu and the Zanaqu from their confluence at Ganasongduo, determined that the Zanaqu was longer, located the source of the Zanaqu using GPS and claimed this spring was the source of the Mekong. However, the principle purpose of TPC maps is to identify mountain peaks. There were not the best maps available for identifying the source of a river.

At the same time that Peissel conducted his expedition, a Japanese team led by Junichi Nakanishi and Masayuki Kitamura of the Tokyo University of Agriculture (TUA) and hosted by Zhou Changjin of CISNR/CAS also sought to locate the source of the Mekong. According to his book, Peissel was aware of the Japanese team but did not know if they determined a location for the source. Via CAS, the Japanese had access to 1:100,000 scale topographic maps with a contour interval of 40 meters. These maps were the best available for determining the source location. The maps were published in the 1970's and indicated that the Zayaqu is longer than the Zanaqu. In September, 1994, the TUA/CAS team identified the source as 94° 41' 37" E, 33° 42' 41" N, elevation 5160 meters, a glacial spring feeding the tributary Lasagongma, but did not publish this information until October, 2001 (Kitamura, Japanese Alpine News Vol. 1).

In the headwaters of the Zayaqu there are two tributaries which have sources which are nearly equidistant from Ganasongduo: Gaodepu and Gaoshanxiqu. The TUA/CAS team had gone to the source of Gaoshanxiqu, but CISNR was not absolutely sure that the TUA/CAS had found the true source of this tributary and instead published the location of the confluence of two springs (94°41' 35" E, 33° 44' 13" N, elevation 5167 meters) in *Geographical Research* in 1995 - about 3 km north of the location identified by the TUA/CAS team.

The sources reported by TUA/CAS and CISNR are based on distance measurements from topographic maps. Although these maps are far more suitable than the maps used by Peissel, they are not as accurate as satellite photography. The TUA/CAS source is only 62 meters lower and 360 meters north of the true source reported in 1999 and 2001, a distance that could easily be explained by four years of glacial retreat.

In late 1998, Earth Science Expeditions (ESE) began planning an August, 1999 first descent of the Mekong from its source. Initially, the plan was to travel via horseback to the source on the Zanaqu as published by Peissel, carrying inflatable kayaks, follow the Zanaqu downstream until it became large enough to float, then float about 150 km to

Zadoi. ESE had been using the Chinese 1:100,000 scale topo maps since 1995, but only while in China because the Chinese would not allow the maps to leave China.

In early 1994, the Russians sold their 1:200,000 scale topographical maps of China (contour interval of 80 meters, produced in the 1970's) to major universities in the US and Europe (including Britain and France). However, ESE did not learn of the availability of these maps until early 1995, so it is understandable that Peissel was also unaware of these maps when he conducted his expedition in September 1994. Though not as accurate as the 1:100,000 scale Chinese maps, they are much more suitable for identifying the source of a river than the 1:500,000 scale TPC maps used by Peissel.

While reviewing the Russian maps in late 1998, ESE realized that the Zayaqu appeared to be longer than the Zanaqu, and asked its representative at the Center for International Exchange (CISE) of CAS, Ma Da, to check the Chinese 1:100,000 scale maps. Ma Da confirmed this observation, then located the CAS representatives who had accompanied Japanese team mentioned by Peissel. In early 1999 Ma Da began discussions with Zhou Changjin of CISNR regarding the possibility that Peissel had not identified the true source of the Mekong.

Masayuki Kitamura of TUA was also planning an August, 1999 first descent of the Mekong from its source. Based on their 1994 expedition, they planned to travel by horse to the source of the Zayaqu, then follow it downstream until it became large enough to float, then float past Zadoi to Qamdo, Tibet. ESE was unaware of TUA's plans, and vice versa.

CISNR, with the assistance of Guan Zhihua of the Dixiang Business Group of Tianjin (DBG), initiated a detailed study of satellite photos of the Mekong headwaters region in early 1999. This study included the length of tributaries from the base of glaciers, the tributary drainage areas and the surface area of glaciers feeding the headwater tributaries. The Zayaqu was measured to be about 5 km longer than the Zanaqu, eliminating the Zanaqu as a source.

CISNR/DBG then organized an expedition in July, 1999 to travel to the source identified from their study, the glacial spring feeding Lasagongma on the north side of Guosongmucha Mountain - the same source the TUA/CAS team had visited in 1994. Simultaneously, Liu Shaochuang of the Remote Sensing Office (RSO) of CAS evaluated satellite photos and organized an expedition sponsored by Chinese businesses to the source identified from his study, a spring located at Mt. Jifu, 94° 41' 12" E, 33° 45' 35" N,

elevation 5552 meters, between the Mekong and Yangtze drainages. Please see the Kitamura's maps in Japanese Alpine News Vol. 1, October 2001.

The CISNR/DGB team went to Ganasongduo in July 1999 to remeasure the relative discharges of the Zayaqu and Zanaqu, then progressed upstream to the source of Lasagongma and erected a plaque identifying the glacial spring at 94° 41' 44" E, 33° 41' 44" N, elevation 5224 meters as the true source of the Mekong.

Upon his return he informed Ma Da that the official source of the Mekong was the Zayaqu, and with less than a month's notice ESE had to change its plans to float this stream rather than Zanaqu.

The difference in the distances from Jifu and from Lasagongma to Ganasongduo was so small (about one km) that the CISNR/DBR and RSO groups agreed to accept the largest of the two tributaries (Gaodepu and Gaoshanxigu) as the tributary whose source was the true source. Consequently, Zhou Changjin asked to join the August, 1999 ESE expedition to the upper Zayaqu, then went upstream to Yeyonsongduo, the confluence of the Gaodepu and Gaoshanxigu, to measure relative discharges while ESE prepared to begin floating to Zadoi.

The TUA team lead by Kitamura departed from the point on the upper Zayaqu where it was large enough to begin floating (about 30 km below Yeyonsongduo) a few hours before the ESE team, led by Pete Winn, arrived.

#### Conclusion

The results of the discharge measurements made by Zhou Changjin at the confluence of Gaodepu and Gaoshanxigu supported the CISNR/DBG identification of the Lasagongma spring as the true source of the Mekong, located at 33° 42' 31" N, 94° 41' 44" E, elevation 5224 meters - a short distance from the source identified by the TUA/CAS team in 1994. The officially recognized location was published jointly by Guan Zhihua, Zhou Changjin and Tao Baoxiang of CISNR/CAS & DBG in Geography in October, 1999, with reconfirmation and further explanation in an article published by Zhou Changjin and Guan Zhuhua of IGSNRR/CAS in Geographical Research in May 2001. It is based on distances from springs at the base of glaciers to Ganasongduo measured using satellite imagery and is the most accurate measure of the source of the Mekong to date.

#### References:

Guan Zhihua, Zhou Changjin and Tao Baoxiang. October 1999. Lancang Jiang (Mekong River) Identification of the True Source and Headwaters. Geography (English translation by Tamotsu Nakamura).

Jin Changxing and Zhou Changjin. March 1995. The Source of the Mekong River. Geographical Research, Vol. 14, No. 1 (English translation of abstract by Tamotsu Nakamura).

Kitamura, Masayuki. October 2001. The Source of the Mekong River. Japanese Alpine News, Vol. 1, No. 1.

Nakumara, Tomatsu and Kitamura, Masayuki. 2001. Japan-Sino Expedition 1994 to Source of Mekong. Unpublished report.

Nakumara, Tomatsu. 2001. Quest for the Source of the Mekong River: Notes on a Controversial Issue on the True Source. Unpublished report.

Peissel, Michel. 1995. Discovery of the Source of the Mekong. Henry Holt, NY.

Winn, Peter. 1999. The Source of the Mekong River, Qinghai, China. Internet document <http://members.aol.com/pswinn3/mekongsource.html>.

Winn, Peter, and Ma Da. 1999. Mekong Headwaters Expedition. Internet document <http://members.aol.com/pswinn/zaqu99.html>.

Zhou Changjin and Guan Zhihua. May 2001. Reconfirmation on Identification of True Source and Headwater of Lancang Jiang (Mekong River). Geographical Research, Vol. 20, No. 2 (translation by Tamotsu Nakamura).

Zhou Changjin. July 2001. Email message to Ma Da (at the request of Peter Winn) regarding conflicting published locations of the source of the Mekong.

