The Yangzte River and Three Gorges Dam

Left. Yangtze River, Three Gorges section. The Yangtze River is 6300 kilometers (approximately 3,900 miles) long and is known in China as the "long" or "great" river. *Photo courtesy of Wikipedia Commons.*
Right. Three Gorges Dam construction site. *Photo by Steven Benson. Courtesy of International Rivers.*

Construction of China's Three Gorges Dam on the Yangtze River in Hubei Province began in 1994, a dam so large it is visible to the naked eye from space. In 2003, the massive 610 foot high, 1.3 mile wide dam, began producing power. It is the largest hydroelectric project in the world. Final construction of the dam body was completed in 2006, with the 400-mile-long, three-mile-wide, reservoir scheduled to rise to 175 meters (574 feet) upon completion. The Three Gorges Dam has 32 main generators, with six more scheduled for completion in 2011. The dam's main purpose is to control the river, to halt catastrophic flooding that has killed hundreds of thousands in the twentieth century, to harness its power for energy, and to allow very large vessels to reach the nation's interior. The dam's total electric generating power will ultimately be 22,500 megawatts, enough to power millions of homes and provide a large portion of China's energy needs. The navigation locks allow 10,000 ton ships to traverse the river. Prior to the dam, ships over 1,500 tons could not reach the interior.

The Three Gorges Dam is more than 600 feet high and is composed of 30,000 tons of concrete. It has cost more than $23 billion, with expenses continuing to rise as the Chinese government mitigates harmful impacts from the dam. Historically, the Yangtze River has played a significant role in developing agriculturally complex societies, also providing a transportation network for people and goods from ancient times. Despite protest in China and from the international community, the Three Gorges Reservoir displaced approximately 1.3 million people and inundated 13 cities, 140 towns, and 1,350 villages. Thus, homes and factories, farmlands and fisheries, ancient temples and cities, have been submerged in an artificial lake.

NASA scientists report that the dam altered the water flow so dramatically it has changed weather patterns. Rainfall has decreased near the dam and increased in nearby mountains, where temperatures dropped by 1.2 degrees Fahrenheit. Meanwhile, attempts to increase the water level to 175 meters in the fall of 2009 resulted in drought conditions downstream. Crops failed and freighters were stranded in the mud. At the end of the year, the dam remained at approximately 171 meters and had not achieved full hydropower capacity. As more dams are planned on the Yangtze, many suggest that alternative forms of clean energy, such as wind power, would be would be more cost efficient and less harmful to the human and natural environments.

The upstream side of the Three Gorges Dam prior to filling the reservoir. *Image courtesy of Wikipedia Commons*

The Three Gorges Dam sits on two major earthquake fault lines. In the seven months after the water level began its second major increase in 2006, scientists recorded 822 tremors around the reservoir.

Landslides present another danger. The shore of the reservoir has already collapsed in nearly 100 different places. As the water rose in late 2009, cracks developed on the land and in the walls of nearby houses.

Pollution from inundated communities, factories, and sewage also present concerns due to the reduced rates of flow in the river behind the reservoir.

"When I had land I could grow my own food and was free to work when I wanted, I was happy then."
Resettled migrant in Wanxian City.

Farmer/Artisan, Baoshan Village, Jinsha (upper Yangtze) River, China. *Photo courtesy of International Rivers*

Although the Three Gorges was built to solve problems, it has created new difficulties. The government agreed to provide land to farmers, jobs to displaced city residents, and cash compensation for those ousted by the dam. However, those promises have often been broken. Many have received small plots of barren land or been sent to urban slums without resources, jobs, or housing. In 2000, the Chinese Academy of Sciences conducted a survey with a small number of rural migrants who had been relocated to Wanxian City. They found that most were worse off than before resettlement, with higher levels of unemployment, less income, and only half as much land as before. There is no mechanism for addressing grievances and protest has often been met with repressive tactics.

Three Gorges has also flooded historical and cultural sites. Approximately 1,300 known archaeological sites have been inundated. While some cultural resources have been saved, others are too large or permanent to be moved.

Three Gorges Dam and Development Timeline

1919 Sun Yat Sen proposes a dam in the Three Gorges for power production and navigation. By the 1930s surveys for a dam begin. A feasibility study is completed in 1944.
1954 After devastating floods along the Yangtze, Mao Zedong asks the Soviet Union for assistance in planning and building the Three Gorges dam.
1970 Work begins on the Gezhouba Dam in Yichang as a step toward a larger Three Gorges Project.
1984 The Chinese government decides to build a low dam in Xiling Gorge, creating a reservoir with a water level of 492 feet. The city of Chongqing objects.
1989 The Yangtze Valley Planning Office, the government office in charge of the dam project, proposes a high dam with a reservoir level of 574 feet. Gezhouba Dam is completed.
1994 Construction of the Three Gorges Dam begins, overseen by the Three Gorges Project Construction Committee (TGPCC). Resettlement begins and continues into the next decade.
1998 The Yangtze River floods, killing more than 1,000 people and causing billions of dollars of loss.
2003 The dam's reservoir begins to fill. Within weeks it reaches 135 meters, more than 400 feet. Power production begins. By 2009, the dam has financed 1/3 of its own costs.
2006 The dam body is completed. The water level rises to 156 meters, 511 feet.
2009 Water levels are expected to reach 175 meters, 574 feet, but efforts to raise the reservoir are stalled due to drought and landslide concerns.

Suggested Resources

Butler, Linda, *Yangtze Remembered: The River Beneath the Lake* (Stanford, California: Stanford University Press, 2004).
Dai, Qing, Patricia Adams, and John Thibodeau. *Yangtze! Yangtze!* London: Earthscan, 1994.
NASA, Visible Earth and Earth Observatory, available at http://www.nasa.gov/. Search for Three Gorges.
Perry, Ellen, Audrey Topping, Danny L. McGuire, Stephen J. Moffitt, and Martin Sheen. *Great Wall across the Yangtze Yangtze Jiangshang de chang cheng*. [Alexandria, VA]: PBS Home Video, 2000. Available at http://www.pbs.org/itvs/greatwall/resources.html
Qing, Dai, John Thibodeau, and Philip B. Williams. *The River Dragon Has Come! The Three Gorges Dam and the Fate of China's Yangtze River and Its People*. Armonk, N.Y.: M.E. Sharpe, 1998.