Three gorges dam: its background and relevance

Countries, China

This report examines the Three Gorge dam project and its impacts on theenvironment, the people it will effect and measures that can be taken as an alternative to the dam. I will discuss the Chinese government's reasoning for constructing the dam and the negative aspects of such a construction. Then I will explain the more environmentally friendly and logical alternatives. The concept of the Three Gorge dam is over 75 years old, dating back to when it was first proposed by the nationalist leader Sun Yat-Sen, in 1919.

The dam was a dream of communist leader Mao Zedong, who felt it would be a potent symbol of China's self-sufficiency and ability to develop without western aid. The state media has reported only the rosy side of the Three Gorges project, presenting it as a powerful symbol of a new, prosperous China. Outgoing Premier Li Peng said the Three Gorges Dam would ''demonstrate to the world that the Chinese people have the ability to build the biggest and most beneficial irrigation and hydro-electric project in the world''.

The Three Gorges refers to a 120-mile stretch of limestone cliffs along the upper reaches of the Yangzi River where the water drops precipitously through the Qutang, Wu, and Xiling gorges. The region is linked to folklore and important historical events, and its beauty has inspired Chinese painters and classical poets such as Li Bai for centuries. The dam, which will be 1. 3 miles long and 610 feet high, is expected to be completed by 2009.

It will create a 385 mile-long reservoir stretching back up the river that will totally engulf the Three Gorges, as well as 115, 000 acres of rich farmland, thirteen cities, hundreds of villages, and countless historic temples and

archaeological sites. Between 1. 4 and 1. 9 million people will need to be resettled. The proponents of the dam claim that the introduction of such a large amount of clean hydroelectric power into China's rapidly expanding economy will mean a significant reduction in the emission of fossil fuelpollution.

First, it will generate 18000 megawatts of electricity, which would reduce the country's reliance on coal by one tenth. Hence reducing China's overall greenhouse gases. Second, it will prevent the periodical flooding of the Yangzi, which has already claimed the lives of half a million this century alone. The dam is expected to cut incidents of serious flood from once in 10 years to once in 100 years. At present 15 million lives are at stake as the river rises higher above the surrounding land because of sediment deposits on the riverbed, while dikes can no longer be raised safely.

Third, it will make the upper part of the Yangzi more navigable, " raising the river's navigable tonnage by a big margin". Improved navigability would allow ocean-going freighters to penetrate the depths of China's remote Southwest, bringing much needed economic development and prosperity to the region. The project is also expected to develop reservoir fisheries, stimulate tourism in and around the reservoir, improve water quality downstream, protect the lake areas downstream, and enable south-to-north water transfer sometime in the next century. 4. 0 Dilemmas surrounding dam construction

There are many problems entangled with the construction of such a dam, two of which stand out. First, the fact that so many civilians have to be

moved against their will. 13 cities, 140 towns, more than 1600 villages, and 300 factories will be submerged, and nearly 1. 5 million people relocated. Second, the effects that the rise in level of river will have on the environment. This includes the destruction of habitats for at least four indigenous species in the area. According to official figures, 10. 2 million people have been relocated for the construction of dams in the past in China.

In each case, there have been economic or political problems that has often led to intimidation and sometimesviolenceto force the people to resettle. This is due to people's reluctance to leave their homes, which can be attributed to poor planning on the government's part. The number of people to be resettled in the Three Gorges dam project has been estimated to range between 700, 000 to 1. 98 million. Such variation in figures is due to the fact that it depends on whether the information was gathered by the dam's supporters or critics. There has been a large amount of local opposition to the dam.

Their opposition is mainly based on the poor record of China's Ministry of Water Resources, which includes the collapse of 62 dams in the past due to poor design. However, since the Chinese government never acknowledged such disasters in the past, it could not be brought up in hearings on the Three Gorge project. People in the effected area who have in the past organised against the dam were arrested and sentenced to prison for " counter-revolution" and the police presence in the area has since been increased. The local officials are not quite helping ease the situation.

The distribution of compensationmoneyby local authorities (US$1300 per person) offered to people displaced by the dam has been tainted by corruption. 105 local party officials involved in the project have been arrested already. Almost half of the project's resettlers are farmers. But since there is an inadequate amount of farmland left to be shared, the officials have planned for moving the resettlers into industrial jobs. This is quite an impossible task considering that the farmers have been farming in their area for generations and have absolutely no expertise in industrial work.

It is a great concern that the construction of the dam will result in the destruction of the natural habitats of many of China's indigenous wildlife species. This includes the Chinese alligator, the white crane, the river dolphin and the prehistoric Chinese sturgeon, a fish unique to Yangzi waters. Experts warn that, by forever changing the hydrology of the river for thousands of miles, the dam will destroy commercial fish stocks and deprive the complex floodplain agricultural systems of the water and silt they need.

Hence threatening the livelihoods of 75 million people who live on fishing or farming along the Yangzi's bank. Even if the 75 million people find another source to live on, there is yet another problem to be solved; toxic pollution. The factories along the Yangzi river are so polluting that over 200 paper mills and tanneries have already been closed down around the Three Gorges dam site to boost environmental protection. The contamination of the river by the toxic chemicals may increase due to the 1600 factories in the area that are not cleaned up and moved before the waters begin to rise.

China is the world's second leading producer of greenhouse gases. If China's current growth rates continue, it will need to develop an additional 17, 000 megawatts of energy per year for the next decade. And if coal is used to generate this energy, the environmental impacts could be disastrous. Whether or not the dam is constructed, hydropower will only account for no more than 20% of China's electricity generated by year 2010. This shows that coal will be used even more widely than it is now, to meet energy needs.

Hence the dam will not have much impact on helping meet energy needs. China needs to find a cleaner, more efficient way of creating power. The Three Gorge reservoir is currently designed to hold 20 billion cubic meters at the flood level. But this capacity is only equivalent to 4% of the total run off water in the region. " It is obvious from common sense that this capacity could not hold back flood waters enough to reduce significantly the flood risk at the lower reaches. "

Another problem is the fact that the Yangzi carries a large amount of silt. This silt can be carried all the way to the dam and a big 'mud pond' could result. There is no suchtechnologyavailable to divert or collect the silt at the dam. From an ecological point of view, the dam will be clogged by the large silt deposits, in the Yangzi, and will also trap much of the pollutants that normally would be washed out to the ocean.

Along the Yangzi, about 80 percent of the cities do not have sewage systems, and it is cheaper to dump the waste in the river instead of a sewage treatment plant. Burial grounds in both Wushan and Fengjie

counties, Sichuan are known to have been dynamited to make way for scientific excavations in advance of the dam project. One thousand tombs dating between the Han and Ming periods (206 BC to AD 1644) were also blasted away. The problem lies with lack of funding. The initial budget (US$250 million) for excavation and preservation was reduced to US$37. 5 million.

Only a small amount of this sum has been distributed to local authorities because government officials have been unable to decide which agency should administer the funds. The Three Gorges dam will be the most expensive single construction project in history. The Chinese leaders are so determined to build the dam, that they haven't considered whether it is economically viable. In 1992 the official cost of the dam was set to US$11 billion. Estimates now exceed US$75 billion. This could slow down China's recent economic boom. The dam project is heavily funded by foreign export agencies.

If people in foreign countries were to stop foreign investors and government organisations which support the project, the Chinese officials would have no choice but to reconsider their plans. But since it is not in the foreign investors' best interest monetarily, they have kept supporting the Chinese government. Hydrological experts have argued that effective flood management includes dyking, flood proofing, flood warning systems, diversion areas, and development restrictions in floodplain and designated diversion areas and that dams are not always the answer.

The Chinese officials' mentality is that the " biggest structure" is the best structure, but what they must realize is that it does not mean the best structure. That Chinese hydropower could be produced on a number of tributaries that flow into the Yangzi. This procedure has been proven by scientific examples that prove that separate dams will produce more power and last longer then one main dam. Sedimentation of separate dams would be less and these dams would be able to preserve China's cultural history.

The greater amount of smaller dams would cause less soil erosion and more power for a much lower cost. It would be able to compete with China's booming industrial sectors and preserve the aquatic life. The construction of these smaller dams could also mean that it would lesson the amount of people to be resettled, and would save the Chinese government billions of dollars. However, the smaller dams would not allow large transportation of cargo down the river.

Based on a recent study by United States and Chinese energy research institutes, which compared conventional sources with advanced generating technologies, cleaner alternatives, such as smaller gas turbines or cogeneration plants were found to be more economical for power generation than big hydro dams. Combined cycle gas turbines could provide power with lower capital costs and greater reliability than the Three Gorges dam and with far fewer emissions than conventional coal plants. Combined cycle plants are commonly fuelled with natural gas, which burns more thoroughly than solid or liquid fuels.

And unlike coal, it contains no heavy metals or sulfur emissions that cause acid rain. Combined cycle plants can be installed and generating power reliably within nine months to two or three years for larger units. Three Gorges dam is scheduled to take 17 years. In addition energy specialists argue, that switching from coal to gas, and using new technology of combined cycle gas turbines or cogeneration, would create greater environmental benefits than the Three Gorges dam by a 60% reduction of carbon dioxide emissions. Whereas the Three Gorges dam would reduce carbon dioxide emissions by only 5%.