**YANGTZE RIVER AND THE THREE GORGES DAM PROJECT**

The Yangtze River is the longest river in Asia. The river is a major transportation route for China, connecting the interior with the coast. River traffic includes commercial traffic as well as river cruises for tourists. Unfortunately, flooding along the river has always been a major problem. To help control flooding issues, as well as increase economic development and trade and generate much needed electricity, the Chinese government decided to build the Three Gorges Dam.

First proposed by a Chinese leader in 1919, the project finally began in 1992. The Three Gorges Dam is the largest hydroelectric dam in the world. More than a mile wide and over 600 feet long, the dam is the world’s most extensive and expensive engineering project. While the official cost of the project is $25 billion, some say the Chinese may have spent as much as $75 billion on the dam. It has become a symbol of prestige in China, boasting political success, and has been compared to the Great Wall of China in its importance. However, it has also stirred controversy, both within China and abroad.

Geographic factors determined where the dam would be built. The Three Gorges is an area where the Chang Jiang (Yangtze) is very narrow—only about 350 feet wide as the river flows between steep cliffs. The area is named for this geographic feature. A gorge is a deep, narrow passage surrounded by steep cliffs. When snows melt in the spring or heavy rains fall during summer monsoons, the river can rise very quickly in the narrow area. For more than 2,300 years, this seasonal rise has caused major flooding and millions of deaths.

As work on the dam began, a large artificial lake called a reservoir formed behind it to store the water being held back. This reservoir is about 500’ deep, and is longer than Lake Superior in the U.S., the largest natural body of fresh water in the world. During dry periods, the dam will slowly release water from the reservoir. This raises the level of the river downstream to allow large ships to travel to China’s interior, opening up whole new trade routes for China’s industries. During wet monsoon seasons, the water level will be reduced in order to contain flood waters. This is perhaps the dam’s most important benefit. To date, 214 major floods have been recorded along the Chang Jiang, averaging about 1 major flood every 10 years. Within this past century, there have been five floods that have claimed hundreds of millions of lives, millions of acres of farmland, destroyed thousands of homes, and cost billions of dollars in damage. Proponents of the Three Gorges Dam believe that it will serve to protect 15 million people and 1.5 million acres of farmland that are currently vulnerable to flooding.

Indeed, the dam has withstood three major flood tests so far. Flash floods have also been eliminated to the point where no human life will be in danger. By controlling the waters of the Yangtze, the Chinese can also harness some of the water to alleviate droughts upstream from the dam. This will help many farmers who have had difficulty irrigating their crops during the dry seasons.

Another major benefit of the Three Gorges Dam is the amount of hydroelectric power it generates. Giant turbines work to generate 16,750 megawatts of electricity, the power equivalent of 18 nuclear power plants. Another positive effect is the reduced emissions in toxic fumes. The dam will decrease coal burning by 50 million tons, and carbon dioxide emissions by around 1.2 -1.3 million tons. The rate of energy production, equivalent to burning 11,000 barrels of oil per hour, is enough to supply Beijing with power for one year. Nationally, the dam has the potential to generate enough hydroelectric power to account for 3% of China’s total energy needs.

Despite the economic and life-saving benefits, the Three Gorges Dam has been referred to as “The most environmentally and socially destructive project in the world” (Dai Qing). The descriptions below outline some of the dam’s most important drawbacks.

**Relocation:** In order to create the reservoir behind the dam, a large expanse of land had to be cleared. 13 cities, 140 towns, and 1600 villages have been submerged underneath the world’s largest reservoir. Not only did the Chinese flood over 100,000 acres of farmland, but approximately 1.5 million people were displaced from their cities and villages, and more than 1,000 historic and cultural sites are now under water. Five-hundred thousand of these refugees are peasant farmers, many of whom earn just $0.33 per day. Those that were relocated were not offered proper compensation to cover the cost of new housing. These people are not just being taken from their homes, but from their job, culture, and their way of life. Refugees from rural areas that were moved to urban cities lack training for industrial jobs, and those who remain farmers are not able to produce crops on the unfertile land provided by the government. Problems associated with the resulting increase in urbanization include serious cases of discrimination by locals, who have launched violent attacks on the refugees and forced them to leave. In addition, many refugees are suffering from food shortages and lack of clean water. The government tried to justify the relocation process, claiming that the area was already suffering from overpopulation and was unsuitable for industry. They say that even if the dam was not built, many of those who were relocated would have decided to move anyway, because of economic means. China’s government has finally acknowledged the vast environmental destruction, and has started to develop extensive plans to address these problems. However, government officials continue to deny the negative social consequences of the relocation process, and have yet to implement any change to alleviate the great social unrest that has resulted in the relocation of 1.5 million people.

**Water Pollution**: The dam has blocked approximately ten million tons of plastic bags, bottles, animal corpses, trees, and other items that would have otherwise have flowed out to sea. The Yangtze River is one of the most polluted rivers in the world. Dumping industrial waste and sewage into the river has always been a serious problem. More than 265 billion gallons of raw sewage are dumped into the Yangtze annually. In addition, the reservoir itself flooded 1,600 abandoned factories, mines, dumps, and potential toxic waste sites. Because the dam prevents any of this material to be washed out to sea, water quality in the Yangtze has become much worse since construction began.

**Siltation:** Because of reduced water speed behind the dam, an estimated 530 million tons of silt will accumulate behind the dam. This may cause floods behind the dam and limit the ability for water to flow quickly enough to generate electricity.

**Ecosystem Disruption**: The giant hydroelectric dam serves as a physical barrier that disrupts the river ecosystem. In an environmental impact assessment, it was determined that there are 47 endangered species in the Three Gorges Dam area that are supposed to be protected by law. Two of the most popular marine animals in China, the Chinese River Dolphin and the Chinese Sturgeon, are included in the list of species put even more at risk by the dam. Ecosystem disruption poses not only environmental problems, but economic problems as well. The physical barrier interferes with fish spawning, and in combination with pollution, the dam will have a serious impact on the fishing economy of the Yangtze River.

**Deforestation:** Forests work to negate greenhouse gas accumulation in the atmosphere. However, the process of deforestation (burning trees) emits carbon dioxide into the atmosphere, and is responsible for 20% of the world’s greenhouse gas emissions. A huge amount of deforestation occurred for the construction of this project, mainly to provide farmland in the surrounding areas for those whose homes and farms were flooded by the reservoir. Much of the land is located on the steep slopes of the gorges, and has been determined as unsuitable for farming.

**Landslides:** The most current environmental concern with the Three Gorges Dam is the prevalence of landslides. So far, there have been 91 places where the shore has collapsed. Some of these landslides have triggered 50 meter-high waves on the reservoir behind the dam. The potential for geological disaster is threatening the lives of millions of residents in the area. Large dams increase the possibility for earthquakes because of increasing geological pressure from rising water. Over 360 million people live within the watershed of the Yangtze River. In the chance of earthquake or dam collapse, millions of people who live downstream will be endangered. Landslides have resulted from a culmination of factors. The Three Gorges area has been always been geologically unstable before construction on the dam began. When relocation began, many people were moved to higher land in the valley just above the flood line. Farmers cleared land to plant crops, but deforestation contributed to soil erosion and destabilized many hillsides. Construction crews are now reinforcing the hillsides with concrete to prevent more landslides, but many of the residents, many farmers and fishermen without much income, are being forced to relocate for a 2nd time. Some residents have received aid from the government, but most are camping out in tents nearby for lack of money and transportation to be relocated.

**Social Unrest:** The Chinese government has worked to create a process for dealing with relocation issues. Government organizations have been set up to ensure the protection of people’s right, obligations of the government, and procedures for settling conflict and addressing complaints. However, not all of these are being properly addressed. There is no proper outlet for issuing community complaints, and as a result, many refugees have great resentment toward central authority. In response to the unsuccessful relocation process, many displaced citizens have petitioned, lobbied, protested, or just returned to their homes. Most protests have been suppressed, with the main organizers convicted and placed in jail.