Document Based Inquiry

China's Three Gorges Dam: Do the Benefits Outweigh the Costs?

Background Essay

China's Three Gorges Dam

For centuries China has used the Yangtze River as its central highway. Its 3,700 mile length travels through the heart of the country and is the world's third longest river. Millions of people live along its banks and transporting themselves, their goods, and agricultural products from town to town has been a way of life since the beginning of Chinese civilization. The Chinese government made the decision to build an enormous dam along a spectacular section of the Yangtze River that flows into three gorges [ravines].

Construction on the dam began in 1994 and was completed on May 20, 2006. The Three Gorges Dam is the world's largest hydroelectric dam and the biggest construction project in Chinese history. More than a mile wide and over 610 feet long, the dam is the most extensive and most expensive engineering project in the world. Estimates of the total costs of the project range between $25 billion, and go as high as $100 billion.

Why would the Chinese government undertake such a massive construction project? The ***benefits*** of constructing the dam include:

- **Power generation** - when at capacity the dam generates more than 18 million kilowatts of electricity (the equivalent of 18 nuclear power plants), roughly 3% of China's total need.
- **Flood Control** - in the past 100 years over 1 million Chinese have died due to periodic flooding of the Yangtze River. The dam controls the flooding capacity of the river.
- **Navigation Improvement** - enabling 10,000-ton ocean-going freighters (size of a cruise ship) to sail directly into inland China for six months annually, increasing trade along the port cities.

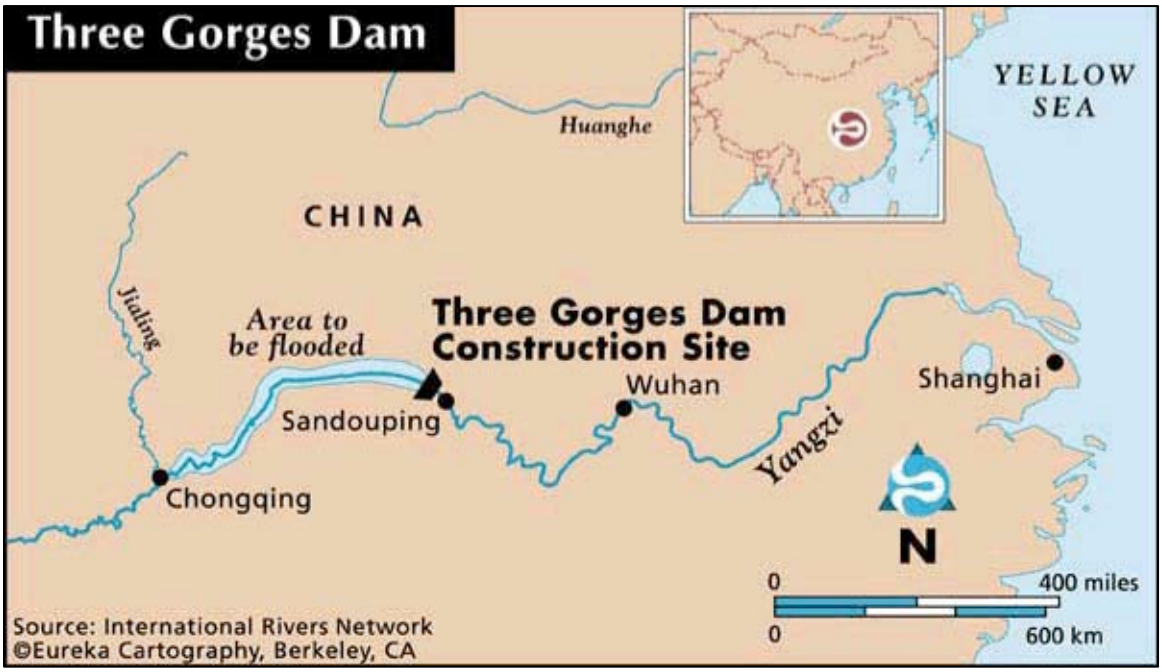
The Three Gorges Dam Project also has many environmentalists, engineers, and archaeologists around the world expressing strong criticism for the devastating human costs of this massive project. ***Criticism*** of the project includes:

- **Displacement/Relocation** - over 1.7 million people were moved to new locations built on less fertile, higher ground, while drowning over 13 cities, 140 towns, and loss of over 100,000 acres of prime farmland.

- **Environmental** - critics worry that the dam has increased the risks of earthquakes and landslides, and threatens the river wildlife while pushing some animal species to extinction.
- **Cultural Impact** - archaeologists and historians estimate that over 1,300 important sites are now under water creating the loss of ancient artifacts some over 6,000 years old.

Now you can weigh in and decide what you think about the Three Gorges Dam. After reading and analyzing the documents, answer the question that millions of Chinese citizens and individuals around the world have been asking: Do the benefits of the Three Gorges Dam outweigh the tremendous costs incurred?

Document A
Three Gorges Dam Construction Site Map



Document Source: International Rivers Network [http://www.internationalrivers.org/] (2000)

Document A Questions

1. The dam was built on which river?

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2. The "area to be flooded" zone is between which two cities?

_____

3. Use the map scale to determine the distance of the "area to be flooded" by this project.

_____

_____

Does this document support or criticizes the construction of the dam project?
Circle one: Support Criticizes

What is the topic of the document? Circle one: Power Generation Flood Control
Navigation Improvement Environmental
Displacement/Relocation Cultural Impact

Document B
Chinese Air Pollution

Document Source: *China Failing New Urban Air Quality Standards* published March 2, 2012 [bikyamasr.com]

Document Source: *China Debate: Insight and Commentary on Policy and Business in China*, by Malcolm Ridell, August 12, 2011

Chinese Air Pollution

- China relies on coal for three quarters of its electricity
- Its air is among the foulest in the world
- A quarter of all deaths in China are from pulmonary (heart) disease
- The nation's carbon dioxide emissions contribute a great deal to global warming.
- Three Gorges Dam, when at capacity, will produce 18 million kilowatts of electricity, 20 times the power of the Hoover Dam, 3% of current Chinese demand for electricity.
- The Three Gorges Dam has blocked an estimated 10 million tons of garbage (plastic bags, trees, animal carcasses, trash, etc.) that otherwise would have flowed out to sea.

Document B Questions

1. What is one major advantage of the Three Gorges Dam to combat pollution within China?

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2. What is one benefit of the Three Gorges Dam that will be felt outside of China?

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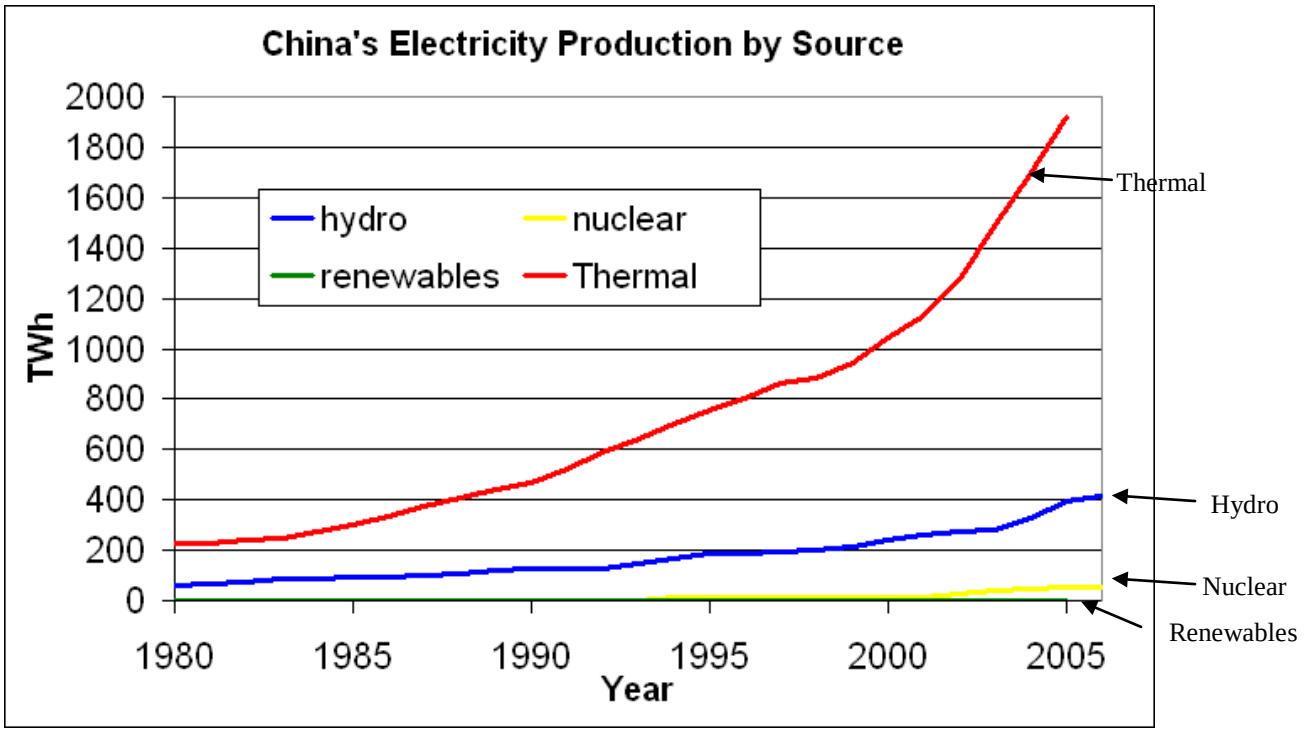
Document C
Electricity in China



Document Source: [http://www.hb.xinhuanet.com/] 12-04-2008, retrieved 3-06-2012

Document C Questions

1. Most of China's electricity needs come from which source?

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2. The Three Gorges Dam will increase electricity production in which category on the graph above?

_____

_____

_____

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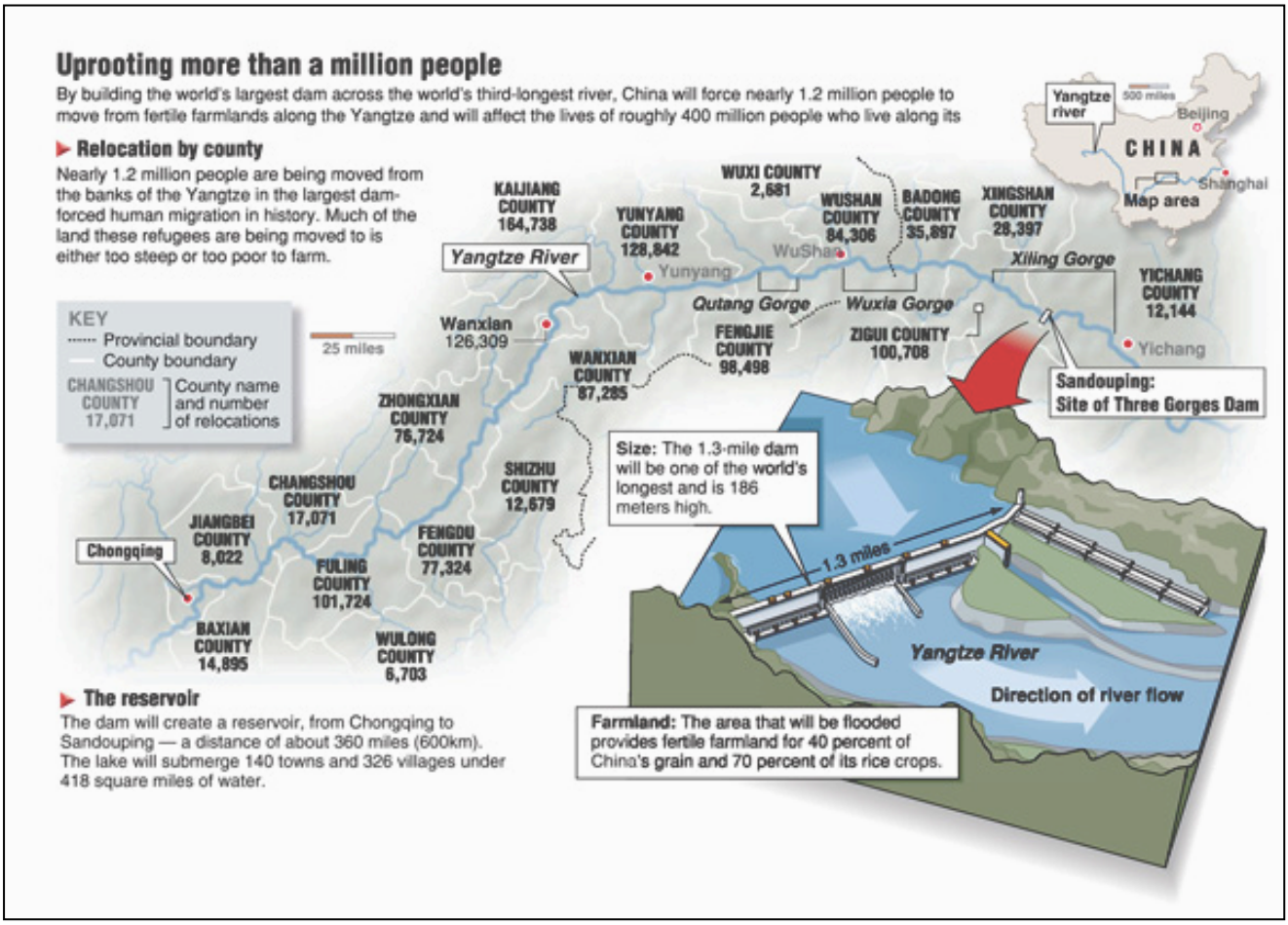
Document D
Uprooting More than a Million People



Document Source: International Rivers Network [http://www.internationalrivers.org/] (2000)

Document D Questions

1. The area that is being flooded currently provides how much of China's grain and rice crop production?

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2. List the names of the three gorges and the counties they are in (including the number of people in each county).

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Document E

Article: Has the Three Gorges Dam Created a Chinese Drought Zone?

Document Source: Written by Jo Ling Kent, CNN June 03, 2011
[http://articles.cnn.com/2011-06-03/world/china.dam.drought_1_dongting-lake-shallow-waters-water-shortage?_s=PM:WORLD]

Farmers and fishermen say the Three Gorges Dam has affected water levels in Dongting Lake in recent years. Hong Yulan has fished the shallow waters of Dongting Lake for nearly 30 years, but this summer she is doing something she never fathomed possible: walking across the bottom of her lake.

"I've never seen the bottom of Dongting before," Hong said as she anxiously wrung her hands. "It is unreal." The ground is littered with overturned boats and dead mussel and clam shells, which once called this now-dry basin home. Young grasslands have recently sprung up in the very same place that just last year was teeming with fish, tortoises and , most importantly, water as far as the eye could see.

Hong is one of millions in China affected by the worst drought to hit China since 1961. As of the end of May, Dongting Lake had already shrunk to less than 45 percent of its usual surface area, according to state-run media.

Situated downstream from the dam, Dongting Lake is the second largest fresh water lake in China. But record low rainfall this year has caused sharp drops in water levels in the middle and lower reaches of the Yangtze River, causing the drought to spread throughout Hunan, Hubei, Jiangxi, Anhui, Jiangsu and Zhejiang provinces. The region has suffered from 40 to 60 percent less rainfall than usual. Millions lack adequate drinking water.

However, for Hong, the dry spell is not the only culprit to blame for her fish-less lake. Along with other farmers and environmentalists, she points to the Three Gorges Dam, the world's largest hydro-power project as a resource nightmare that has exacerbated [worsen] the drought. "The Three Gorges Dam has definitely influenced things here," she told CNN. "The impact is clear."

Document E Questions

1. Do you believe the drought on Dongting Lake was caused by the Three Gorges Dam? Give evidence to explain your response.

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2. Based on the article, what other factors could account for the lack of water in this region?

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Document F
Consequences of the Dam Project

Village Life?

Document Source: "Choking on Growth,"
[http://www.nytimes.com] (2008)

Document Source: International Rivers Network
[http://www.internationalrivers.org/] (2000)

Document F Question

Based on what you have learned, explain what is happening in both of these pictures.

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Document G
Excerpt from *Great Wall Across the Yangtze*

Endangered Treasures

Among the tragedies of the Three Gorges Dam project are over one thousand sites of archeological and historical importance that will be submerged and lost forever upon completion of the dam in 2006. Ancestral burial grounds and centuries-old temples, fossil remains and archeological sites dating as far back as the Paleolithic Age risk being obliterated from public access and scholarly pursuit if they are not unearthed and relocated.

Document Source: Great Wall Across the Yangtze [http://www. pbs.org/itvs/greatwall] (Video released in 2008)

Giant Buddha Sculpture

Giant Buddha Sculpture - A massive sculpture of the seated Buddha rests in the yellowish sandstone cliffs at Single Pebble Village (Danzishizhen) just east of Chongqing. When the tide is high, the statue's base is flooded, and there are watermarks indicating various water levels on the Buddha's feet, legs and lower belly. The sculpture was carved in the late 14th century.

Endangered Treasures

Shibaozhai Temple

Shibaozhai Temple - Dating back to 1545, this Ming Dynasty temple was built against the side of a massive cliff along the banks of the Yangtze River. Called the "Pearl of the Yangtze," the 12 story wooden pagoda rises to a height of 183 feet. An architectural marvel in Chinese history, it has been classified as one of the eight strange structures of the world.

Document G Questions

1. What can be done to save historical artifacts that will be submerged under water with completion of the dam?

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2. Some treasures have been moved to higher ground, others have yet to be, or may never be discovered. What is your opinion concerning the relocation of the artifacts and the possible loss of antiquities (relics)?

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Document H
Flooding on the Yangtze River

Since the beginning of the Han Dynasty 2,300 years ago, there have been 214 major floods recorded, averaging one flood every ten years.

Within this past century, there have been many major floods including:

- 1911 - more than 100,000 dead
- 1931 - flooding killed more than 300,000 people, and left 40 million homeless
- 1954 - flooding Hubei Region caused the loss of over 33,000 lives, 15 million homeless and $ 26 billion economic loss
- 1998 - 4,000 casualties, left 14 million people homeless, and created $24 billion in economic loss.

Document Source**:** "Yangtze River Floods." *Encyclopedia Britannica, Encyclopedia Britannica Online*. Encyclopedia Britannica Inc., 2012.

- One of the major objectives of the Three Gorges Dam is to control water levels due to frequent floods that cause a historical problem around the river areas.
- If severe floods happen, the big dam can hold the water and discharge the flood, which wins time for transferring personnel to avoid loss of life.
- The dam proved effective during the extraordinarily rainy summer of 2010 by holding back much of the resultant floodwaters and thus minimizing the impact of flooding downstream.

Document Source: [http://www.travelchinaguide.com/attraction/hubei/yichang/three-gorges-dam-project.htm]

Document H Questions

1. Is the flooding along the Yangtze River something that can be avoided? Why or why not?

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2. Describe one way that the Three Gorges Dam project will positively affect the people who live along the Yangtze River.

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