



The Ethics of Renewable Resources: Case Study: China's Three Gorges Dam

Within the past decade, many countries have become aware of the harmful effects of the use of fossil fuels. These effects range from pollution in the air and water to adverse health effects in humans. The scientific community has recently come to the conclusion that the use of fossil fuels, which release the greenhouse gas carbon dioxide and other harmful gases, has led to global warming.¹ As a result, many countries have been turning to the development of renewable resources such as windmills, solar power, and hydroelectric power plants. China is one of these countries and within several years they are set to become the world's leading producer of hydroelectric power.² The Three Gorges Dam on the Yangtze River will help China accomplish this goal. Although hydroelectric power generation can help countries reduce their usage of fossil fuels, there are many negative ethical, ecological, and social side effects. Thus, one must analyze these negative side effects to determine if the substitution of renewable resources for conventional fossil fuels is always the best method. In this essay, I will use China's Three Gorges Dam, to be completed in 2009, as a case study to observe the economic, ecological, ethical, and social effects to determine if the use of renewable resources is always the best path to take.



For the purpose of this essay, the economic effects will be based purely on monetary means. The most recent estimates propose the costs of the Three Gorges Dam

¹ According the International Panel on Climate Change

² Keynote Speech at United Nations Symposium on Hydropower and Sustainable Development in 2004


project to be about \$180 billion.³ Although, the Chinese government's figure remain quite lower, between \$25 and \$75 billion.⁴ According to Joanna Gail Salazar, author of "Damming the Child of the Ocean: The Three Gorges Dam project" (2000) "...such costs include those for increased relocation...dredging of the navigation route, reforestation and erosion control programs, dike and levy improvements, excavation of archeological sites, vector control and related health programs, and wastewater infrastructure improvements..." (Salazar, 168-169). Salazar also points out that much of the costs are being financed through the banking system, which may lead to higher inflation less funding for health and education programs and be detrimental to the economy.⁵ However, the dam is also supposed to "calm" the Yangtze River, in order to enable large ocean freight ships to travel inward on the river during certain months of the year.⁶ The hope is that this will increase the economic potential for port towns upward on the river that otherwise would be small, mainly poor villages. But, it is difficult to say whether this potential economic growth will be able to offset the extremely high costs of construction and maintenance of the dam. One must also question whether the current decrease in funding for health and educational programs will be made up in the future or whether it will be a detriment for Chinese children. Are the current high economic costs worth the future benefits the dam may bring? Will future generations be able to pay the costs of maintaining the structure? These are important questions relating to the feasibility of the dam and maybe, the Chinese government should have thought longer about them.


³ Lin Yang. "China's Three Gorges Dam Under Fire." TIME. 12 October 2007.

⁴ According to Salazar and Heggelund

⁵ "Damming the Child of the Ocean: The Three Gorges Project" page 169

⁶ "Damming the Child of the Ocean: The Three Gorges Project" page 168


Another, more obvious, area the dam will have a large impact on is the environment and changing the natural course of the Yangtze River. “Flood control along the Yangtze is a main priority of this project” (Salazar, 164). Ever since people have lived along the river, there have been extreme catastrophes, many deaths, associated with the annual flooding of the Yangtze. According to Salazar, approximately 300,000 people were killed in floods of the Yangtze in the 20th century.⁷ Chinese officials will be able to control the flow of water through the dam and save countless lives that are lost to the devastating floods every year. However, it is also important to note that because of major deforestation along the river, silt deposits can occur behind the dam, and, unless it is maintained, could result in the failure of the Three Gorges Dam.⁸ 



Although flood control may be seen as a positive environmental effect of dam, there are many other environmental effects that are damaging to aquatic life, humans, and the river itself. The Three Gorges Dam will create a large reservoir of water behind it. Due to the fact that there are many factories up river that dump pollutants into the water, the waters in the reservoir have become extremely polluted.  Stagnant waters in the reservoir will also create a perfect environment for a certain type of snail that carries a parasitic flatworm, which is can be harmful to humans. This water may also create a breeding ground for mosquitoes, which can carry malaria. The Chinese government has only set aside a limited amount of funds for treating these infections in their costs for the dam.⁹ How will the government come up with enough money to pay for health care of the mostly poor people who will contract these diseases? Or will they just let the people



⁷ “Damming the Child of the Ocean: The Three Gorges Project” page 164

⁸ Same as above

⁹ This paragraph based on Salazar’s “Damming the Child of the Ocean: The Three Gorges Project” page 166

suffer without any healthcare?  It's hard to tell this now, but maybe within a few years the United Nations or World Bank will have reports on it.

Resettlement of millions of people has also lead to environmental degradation in new areas. "As the number of people to be resettled increases, so does the threat of deforestation, subsequent soil erosion, and river sedimentation" (Salazar, 164). As people move to new at take up their old way of life, farming, they will cut down trees and maybe use pesticides or other chemicals to grow their crops. The deforestation will lead to soil erosion and the introduction of pesticides may lead to more pollution of the land and water. Should the government provide training programs so that farmers can learn a new way to make a living without damaging the environment?  What will be the long term effects of millions of people doing this in a relatively small area along the Yangtze River? 

As mentioned early, aquatic life will also be affected by the dam. "The most publicized has been the imminent extinction of the Chinese sturgeon, as well as the whitefin dolphins...the Chinese alligator, the finless porpoise, the white crane, and certain types of monkeys whose habitat is the limestone cliffs that will be submerged" (Salazar, 166).  Pollution is making life in the river extremely difficult for these animals and some have already lost their habitat since the Yangtze was dammed.  One must question if the loss of these animals forever is worth saving human lives from floods, producing "clean" electricity, and allowing commercial freight ships to travel up stream from the ocean. Although some of these animals are on the brink of extinction, can anything be done to preserve the few that are left?

Yet, as mentioned earlier, other major side effects of the Three Gorges Dam are those concerning the ethical and social aspects of the resettlement of millions of people who lived along the Yangtze River. “The official figure for the number of people to be resettled as a result of the Three Gorges dam is 1.2 million, although other sources believe that the figure will be higher- 1.4 to almost 2 million” (Heggelund, 180). As one can imagine this huge emigration of people was a huge percent of the total cost of the dam, as mentioned earlier. However, the resettlement of people has had significant costs besides just monetarily. Also, due to the complexity of this issue and the limited amount of space I am given, I will only focus on the main points and discuss them in detail as best I can.

Farmlands, villages, towns, and cities will all be submerged.¹⁰ Chinese officials have had to devise plans for compensation, although many argue that people have been given much less than what their land is worth. Officials have also had to plan new cities for the people to move to and how resources, such as land will be redistributed. This would be no easy task for the most organized government and as one may guess the Chinese government as run into many problems in terms of the equity of the redistribution of many resources. Many of the people resettled were farmers and the government has been relatively unsuccessful in providing them with similar land to the one they lost. Because of this “...There is a growing consensus among scholars that people displaced due to construction projects face long-term risks of becoming poorer” (Heggelund, 183). Farmers who lose their land have an increasingly harder time finding food and many are forced to move into cities and find factory jobs in which they have little

¹⁰ Alberts, C Henry, et al. “The Three Gorges Dam Project from a Systems Viewpoint.” Page 592

or no experience.¹¹ “The rural population will not be able to use their skills and farm the land as they did earlier; even if they do not become entirely landless, their piece of land may have shrunk so much that they fall below the poverty line” (Heggelund, 188). This is where the ethical aspect comes in. Is it ethical to move millions of people from their land and then let them become so poor that they are unable to feed their families? Is it ethical to, in a sense, force people to move to a place where they lack the needed skills to survive? Should there be a training program? And, if so, where should the Chinese get the funding?


This mass resettlement also leads one to ask about the social side effects of the project. The research paper entitled “The Three Gorges Dam Project from a Systems Viewpoint” explores how people may be affected mentally by the loss of their land and homes. “Their former homes will be destroyed. The trees will be cut down. Their terraced land will be flooded. From new cities on the hilltops, they can watch the destruction of their old homes” (Alberts, et al, 592). Many studies have shown that these types of stress can lead to depression, alcoholism, drug use, and family dissolution.¹²

An additional social side effect remains, which is the loss of many historical and archeological sites along the Yangtze River. “Recently, archeologists found the earliest signs of Chinese civilization came from the Yangtze area” (Alberts, et al, 594). Not only have the Chinese and the world lost countless historical sites, but we have also lost those sites that were not discovered.

In conclusion, before implementation of renewable resources such as wind farms, solar panels, or hydroelectric plants, the local community must do research to determine

¹¹ Heggelund, Gorild. “Resettlement Programmes and Environmental Capacity in the Three Gorges Dam Project”

¹² “The Three Gorges Dam Project from a Systems Viewpoint” page 594

if the renewable resource will be a benefit or helpful to their community, without cause too much damage.¹³ They must ask questions similar to those that were presented at the end of each paragraph in this paper. Renewable resources may not always be better for the environment than fossil fuels. Switching to wind farms, solar panels, or hydroelectric power plants is a huge undertaking that has many implications and should be discussed at length. Unfortunately, in China, the Three Gorges Dam has been surrounded by controversy because there was no local discussion before construction began. The people who lived along the river had no input on their feelings about the project. The Chinese government viewed the project as something that would make them “famous” throughout the world because the Three Gorges Dam is the largest of its kind in the world. In some cases, as in China, it may be “better”¹⁴ to continue to use conventional fossil fuel energy  sources instead of implementing renewable resources.

¹³ The local community should only implement the resource if the majority of people believe it will be a benefit.

¹⁴ By better I mean more beneficial to the local community.

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