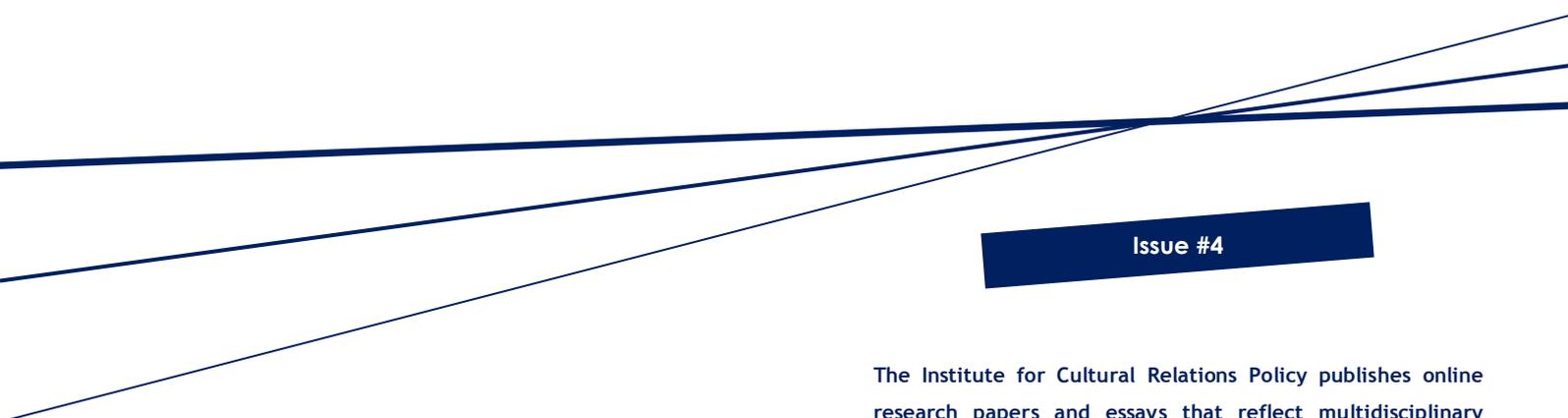


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THREE GORGES DAM

Ágnes Plank*

Although China is the world's most populous country and economic superpower, the increasingly accelerated globalization processes get Asia's most populated country to face with challenges. The Chinese political leadership is forced to cope with three challenges and troublesome issues that can be categorized as the following: social, economic and ecological kinds of problems. The economic growth, and the performance improvements have always dealt with priority, nevertheless these factors occurred with a lot of social and natural disasters in some cases. The communist leadership started too late and inappropriately to handle the problem of environmental pollution. Due to this inappropriate technique, serious damages and catastrophes happened, not to mention the tremendously high investments such as building of reservoirs and dams.

Water shortages, water abundance and floods damaged seriously both the nature and the population in China. Although, the country has an important supply of water, the gigantic population – that is getting bigger and bigger from time to time – settled down patchily, and they mostly live on the North and South part of the country where there is only 19% of the water supply. The obsolete dams and reservoir basins designed by the Soviets make people live in danger, not to mention the fact that villages became empty, because people moved out and also agricultural meadows stayed without gardening. Unfortunately, the Chinese government overlooks the pollution of rivers and water, so factories and industrial plants are constantly poisoning waters so to make them inappropriate to consume, moreover they endangers the existence of rivers as well. A similar occasion happened in case of the river Juma that suddenly appeared because of a factory's cooling process. There is no way for the 50% of China's population to be provided by clear drinking-water, even the main rivers such as Yangtze – whose supply had already used for agricultural watering – become endangered because of the irresponsible and wasting consumer habits. Nothing had happened so far to make this situation better, but numerous plans were made to solve this problem (surface drainage and deep pit digging that endanger towns to sink). Handling these problems is a tremendously huge challenge for the Chinese leadership, as these ecological catastrophes can lead to social and serious economic results as well.

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The economy's huge hunger for the energy becomes higher due to the increasing population. Providing the energy is a giant challenge not only for China, but also for the whole world, as the energy suppliers are limited, but the supplies do not decrease, rather show an increasing tendency. The majority of electricity in China is made by the polluting fossils, mostly coal. The coal mines are really dangerous and polluting. More than 50 million tons of coal are burnt, 100 million tons of carbon-dioxide and 10,000 tons of carbon-monoxide are evolved, and that is a particularly huge quantity.¹ Water as a renewable energy resource could be a more environmentally-friendly solution to satisfy the hunger for energy. Nevertheless, it is a typical feature of the Chinese dams and water reservoirs that they were built on the basis of irresponsible plans and illogical accomplishment. Therefore, two questions come to the surface, namely, how economical the Three Gorges Dam is – viz. it is one of the most expensive investments in the world that generates electrical energy and electricity – and whether it is worth operating or not, as the project costs a huge amount of money today as well. On the other hand, besides its benefits, a lot of drawbacks exist that can provide both the society and the environment with dangers.

Yangtze is the third longest river in the world, so it is China's longest river, 6,300 km. Its name Three Gorges comes from three rivers constrictions on the border of Wu-mountain range, Sichuan and Hubei. The constant floods and dangers of flooding as well as the favourable conditions of sailing and shipping made the political leadership at the beginning of the 20th century to think about constructing a dam. In the 1950s Mao era already had a concrete goal, a project to be accomplished in connection with the construction of the dam. Only 1992 was the year when the concrete decision was made and in December, 1994 the first foundation stone was taken, and the giant construction started. The costs of this gigantic construction and projects associated with it were tremendously huge, and the final amount cannot be estimated. The major establishments of the Three Gorges are the followings: the huge dam, the hydro-electric power plant, and turbines and buildings related to the sailing.² The length of the dam is 600 km, and its height is 185 m, so it is able to contain water until 175 m. In fact, a 600 km length artificial lake was created that abandoned twelve cities and two thousand of other towns in the region. The hydro-electric power plant was equipped by 26 generators of 700,000 kW, its achievement is 84.7 billion kWh a year, and this is almost 14% of the China's electricity in 1992. This achievement is important for providing the

¹ Gleick, P. H., 2009. Three Gorges Dam Project, Yangtze River, China. In: *The World's Water 2008–2009*, pp.139-150. [pdf] Available at: <<http://www.worldwater.org/data20082009/WB03.pdf>>

² A Jangce-folyón tervezett gátrendszer környezeti hatásai (n.a.) [pdf] Available at: <http://ktf.elte.hu/downloads/szakdolgozatok/A_Jangce_folyon_tervezett_gatrendszer_kornyezeti_hatasai_v3_2.pdf>

electricity for the central and eastern parts of the country as well as the South Sichuan part. The first generators started to operate in 2004. In order to accomplish the project, Brazil, Canada, French, Germany, Japan and Switzerland contributed, too.³

The construction of the dam was necessary because of more reasons. On the one hand, the constant floods endangered not only the citizens living their peaceful and safe life there, but also the agriculture as well. The Central Chinese region is the main centre of the rice and wheat growing, where floods endangered and often destroyed the harvest. During the flood in 1998 nearly 239,000 hectares of agricultural meadows were under water, more than 2 million people were damaged, and more thousand people died. Theoretically the project decreased the flood hazards per year to hazards per 100 years so to provide safer living standards for the habitants. Nevertheless, the hydro-electric power plant can only contain the precipitation falling on the top part of the river, and cannot contain it on the bottom part. The accumulating sludge destroys and obstructs the turbines, but its lack makes the part's degradation fast. On the other hand, China is the most polluting country in the world, so more hundred thousand people die every year due to the seriously polluted air and water. The dam was constructed on the basis of renewable energy resources, in this case water, with which help they planned to supply the electricity in the region. If the investment is successful and operates appropriately, numerous polluting coal mines will be closed. It is doubtful whether the habitants will afford to pay for the energy generated by the power station or not, so probably they will refine the cheaper coal.

The construction of the dam anticipated a lot of problems. These issues have two groups, social and environmental type of issues. At the result of the reservoir's construction 1.3 million people were evacuated, and probably this number will increase with other 3 million people. In case of relocation the "soil for a soil" principle was dominant, although, the quality of soil that would be given to people relocating distant from their relatives and living from agriculture, was questionable.⁴ According to a survey carried out in 1998 the responders' 66% thought about their soils' quality as worse, or much worse than earlier. Nevertheless, the accommodation to another new society also posed problems. It was a huge challenge for people living from agriculture to start growing other agricultural plants. Families who were relocated to towns had to cope with working in industry, and face with cultural differences, not to mention the change of social relationships between people. Without doubt, the Three

³ A Jangce-folyón tervezett gátrendszer környezeti hatásai (n.a.) [pdf] Available at: <http://ktf.elte.hu/downloads/szakedolgozatok/A_Jangce_folyon_tervezett_gatrendszer_kornyezeti_hatasai_v3_2.pdf>

⁴ Ibid.

Gorges Dam has positive effects for the society as well. Guest workers from numerous regions (Hubei, Hunan, and Jiangsu) arrived to construct. In the county of Kaixian 32, 000 people leave their home every year so to work as a guest worker to support their families (even 600 million yuan a year). Nevertheless, the government failed a lot with its relocation project. The majority of the relocated people found themselves in a reception-camp-like place, so they settled down in their earlier domicile because of the inappropriate living and working conditions.

The violent changes in the nature and environment had serious results, too. Due to the evacuation of the population and the increasing urbanization, the waters' pollution becomes serious. The sewage and pesticides coming from the towns get into the reservoirs, and these, of course, could be really dangerous for people's health. Unfortunately, cleaning of the waters is a complicated and expensive process. According to some estimation, 40 billion yuan were spent for the construction of 150 sewage systems; although, the degree of pollution is still critical. What is much more frightening is the climatic and habitat changing of the region. The dam has changed the temperature, speed and chemical composition of Yangtze, and altered the dynamics of the river. Due to this, being a natural river it cannot clear itself properly. Moving of its fish stopped, their natural habitat changed, and they run out of food, too. The fish living in Yangtze gives the 36% of China's fish (360 kinds of fish, 29 fish family). As a result of the changes happened by the reservoir, 17% of the fish became endangered, and more 177 local fish's existence became doubtful. The endangered fish stock in the commerce and fishing industry often ruins families as well.⁵

The main goal of the project was to switch from polluting coal energy to renewable hydro-power energy. The sulphur-dioxide emitted by the coal mines decreased; nevertheless, plants under water started to decay contributing to existence of green-house effect gases. The climate above the reservoir has changed tremendously. The 600 km long artificial lake increased a lot the quantity of precipitation in the region, but in other regions its quantity decreased. The soil erosion causes effects until 178 km long. What means the hugest fear is the burst of the dam and the important risks for earthquakes. Since 2003 the reservoir's bank was burst in 91 points. Landslides can generate 50 metres high waves so to put people who living there at risk. The Three Gorges Dam was built on an area endangered by earthquake, so it means a constant risk factor. In 2008 the earthquake of Sichuan province in which 80,000

⁵ Three Gorges dam: the cost of Power (n.a.), 2008. *International Rivers*, October 2008. [pdf] Available at: <http://www.internationalrivers.org/files/3Gorges_factsheet.lorenz_.pdf>

died happened again because of a giant reservoir. Therefore, besides the social and environmental changes, the habitat and population are always in danger as the existence of the dam is instable.

China as an ambitious power and economic giant has already reached important successes. Nevertheless, it still accomplishes numerous projects which are often irresponsible ones and mainly focusing on economic growth and its own interests. It seems to be a valuable step – as declared in the Kyoto contract – that China is about to decrease the pollution of both the air and water. Also, in case of the Three Gorges Dam's construction the economic interests were highlighted. It is not capable of generating the pre-planned energy, and even the consumers cannot afford to pay for the prices either. The evacuation of people led to economic damages as well. Agricultural meadows were ruined or lost, where some time ago orange, wheat and rice grown. The evacuation changed the habitats' lifestyle, and they hardly coped with the new circumstances. In addition, the environmental changes represent a frightening image. Different species of plants and animals became extinct due to the artificial intervention of the mankind. Even the constant risk for earthquakes makes the region dangerous, and endangers the life of thousand millions of people. If the dam happens to break out in the foreseeable future, many people will fall victim to it, and even the wildlife will totally extinct, moreover, all the agricultural areas will be flooded. These damages might be irreversible and irremediable due to the Three Gorges Dam.

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