China’s three gorges dam

Three Gorges Dam nears completion Seth Rosenblatt © 2006 China’s three gorges Dam A mo Del of t he PAst he Three Gorges Dam on the Yangtze River is the world’s largest and most controversial hydropower project. The 660 kilometer-long reservoir displaced 1. 3 million people and is wreaking havoc on the environment. The reservoir reached its final height in 2009, but many of its impacts are only now becoming apparent. China will deal with the project’s legacy for generations to come. Project supporters celebrate the Three Gorges Dam as a symbol of China’s economic and technological progress.

They point out that the power plant substitutes the burning of more than 30 million tons of coal every year, and has greatly improved navigation on the Yangtze River. They also claim that the project has made devastating floods in the Yangtze Valley a thing of the past, and has improved the quality of life of the resettled population. According to former President Jiang Zemin, the dam “ embodies the great industrious spirit of the Chinese nation. ” The Three Gorges Dam was first championed by chairman Mao Zedong in the 1950s, and a feasibility study was commissioned in 1986.

Leading scientists warned about the project’s environmental risks, but were silenced after the massacre on Tiananmen Square in 1989. In 1992, the National People’s Congress – China’s toothless parliament – approved project construction with a record number of abstentions. Dam construction began in 1994 and was completed twelve years later. The power plant, with a capacity of 18, 200 MW, became fully operational ahead of schedule in October 2008. The water level in the Three Gorges reservoir reached its final height one year later.

Six additional generators are currently being installed; the expansion of the project is expected to be completed in 2012. Resettlement without Rights T The Three Gorges Dam, situated in the densely populated Yangtze Valley, is the world’s largest resettlement project. According to official figures, the dam has submerged 13 cities, 140 towns and 1, 350 villages. When the project was launched, the authorities promised to provide replacement land to farmers and new jobs to the urban population. Yet arable land is scarce in China, and the government had to stop resettling farmers on steep hills to check erosion.

And once resettlement began, many state-owned enterprises were closing down rather than creating new jobs. dddddd International Rivers | 2150 Allston Way, Suite 300, Berkeley, CA 94704 | Tel: + 1 510 848 1155 | internationalrivers. org novembeR 2009 On a visit to the reservoir and landslides. According to area in summer 2009, affected the business magazine Caijing, people routinely complained more than 150 dangerous geothat the compensation they logical events were recorded received for their old houses within five months after the was not sufficient to pay for reservoir was first impounded. their new homes.

Some citErosion affects more than half ies such as New Fengdu have of the reservoir area, and 178 overcome the shock of resettlekilometers of riverbanks are at ment and restarted their econrisk of collapse. An additional omy. Others look decrepit a 530, 000 people will have to be few years after they were built. relocated by 2020 in order to In Yunyang, only 45 of the relieve pressure on the fragile city’s 181 factories were moved The town of Yunyang, already desperate and poor (Nick Austin) reservoir slopes. to

higher ground, and many The Yangtze carries more than of them have closed in the meantime.

An estimated 20, 000 500 million tons of silt into the reservoir each year. Some is people have lost their jobs. Many people had to spend their flushed through the sluice-gates at the bottom of the dam, savings to pay for their new homes and could not invest in a but most of the sediment is deposited in the reservoir. This new future. silt is now being withheld from downstream areas. After Following a widespread practice, local officials diverted the dam was completed, the sediment load near the river’s compensation and resettlement funds into their own pockmouth dropped to one third of previous levels.

As a conets throughout the project area. It has been estimated that sequence, up to four square kilometers of coastal wetlands 12% of the resettlement budget has been embezzled. “ Our are being eroded every year. Seawater is intruding up the lives have been ruined by the dam while the big officials got Yangtze, destroying arable land and threatening drinking their fruit and filled their wallet,” a displaced resident told water supplies. the Financial Times. The government prosecuted hundreds of Periodic devastating floods have claimed the lives of millions officials and found more than 300 of them guilty.

Yet secuof people in the fertile plains of the Yangtze Valley. The rity forces came down harshly against people who held out Three Gorges reservoir is acting as a buffer which can mitifor a fairer treatment or protested against abuses. gate the flood risks. Yet because the river deposits its silt load in the reservoir, it now flows faster downstream of the dam, eCosystem unDeR

stRess and is eroding the levees in the Yangtze Valley. This reverses The Three Gorges Dam has completely changed the ecosyssome of the dam’s flood control benefits. tem of the Yangtze River.

It has interrupted fish migration and altered the river’s chemical balance, temperature and velocity. The mighty river has been turned into a stagnant pool with a limited ability to clean itself, and local boat owners are fishing garbage off the surface. The dam has most likely driven the famous Chinese river dolphin to extinction. Populations of the Chinese sturgeon, river sturgeon and Chinese paddlefish have been decimated; all are now considered endangered. Commercial fisheries in the Yangtze and off the river’s mouth in the East China Sea declined sharply after the dam was closed.

In September 2007, government officials admitted that “ if preventive measures are not taken, there could be an environmental collapse. ” Pollution from industry, agriculture and households is causing frequent algae blooms in the reservoir. The government built dozens of garbage and sewage treatment plants, but most of them lie idle because local authorities can’t afford to operate them. DeADly lAnDsliDes The Three Gorges Project is also creating seismic risks. It sits on two major fault lines, and hundreds of small tremors have been recorded since the reservoir began filling in 2006.

Reservoirs have triggered scores of earthquakes around the world, and there is evidence that the devastating Chinese earthquake of May 2008 Landslide at the Three Gorges Reservoir was caused by the Zipingpu Dam. While dams are built to withstand strong earthquakes, the houses, schools and office buildings of millions of people in their vicinity are not. stAggeRing Cost Every

year, the reservoir level at the Three Gorges fluctuates between 145 and 175 meters. This destabilizes the slopes of the Yangtze Valley and has created serious risks of erosion

When the Three Gorges Project was approved in 1992, its cost was estimated at 57 billion Renminbi (or US$8. 35 bil- ChinA’s thRee goRges DAm: A moDel of the PAst PRojeCt BAsiCs The Three Gorges Dam is 101 meters high and 2, 309 meters long. Its reservoir has a length of 660 kilometers. The 26 generators have a total capacity of 18, 200 megawatts – equal to ten modern nuclear power plants. Six additional generating units are currently being installed. The Three Gorges Project has submerged 13 cities, 140 towns and 1, 350 villages, and displaced 1. 3 million people. Hundreds of thousands of people will still need o be relocated to prevent the ecological collapse of the reservoir area. The project cost $27. 2 according to recent official figures, and up to $88 billion according to unofficial estimates. It was financed through government funds, a surtax on electricity rates, domestic bonds, and export credits from the governments of Brazil, Canada, France, Germany, Japan, Sweden and Switzerland. lion at the current exchange rate of US$1= RMB 6. 83). In the meantime, the official figure has risen almost fourfold to $27. 2 billion. There is evidence that some costs have not been included in this figure to avoid the impression of even bigger cost overruns.

Dai Qing, a prominent project critic, estimates that the full cost of the project may be as high as $88 billion. China plans to increase its hydropower capacity from 171, 000 MW in 2008 to 300, 000 MW in 2020. More than 100 dams in the middle and upper Yangtze Basin, including 12 dams on the river’s mainstream, are currently in the planning and construction phase.

These projects would compound the environmental impacts of the Three Gorges Dam, and wipe out the remaining fish habitats in the river. The state-owned China Three Gorges Project Corporation has a self-interest in developing more hydropower projects, nd has taken on several new dams on the middle and upper reaches of the Yangtze River. China is eager to export its experience with the Three Gorges Dam to the whole world (see box). China adopted strong environmental protection laws during the last ten years. Yet they are seldom enforced. While dam projects require environmental impact assessments to be sanctioned by the government, project developers often fail to complete an assessment before construction begins, and governments often don’t step in until a project is nearly complete. This makes stopping destructive projects very difficult.

Also, the fines for violating environmental laws are low and do not encourage compliance. ChAnging CouRse? Prime Minister Wen Jiabao reported in 2007 that over the years, dam building had displaced no less than 23 million exporting the three gorges experience China had to rely on Western technology to build the Three Gorges Project. The companies which supplied the power equipment – including ABB, Alstom, General Electric and Siemens — had to manufacture half of all turbines and generators in China, in cooperation with local partners. As in other sectors, the Chinese students soon adapted the Western technology and overtook their masters.

The Chinese companies involved in the Three Gorges project started exporting large turbines and generators for hydropower dams around 2003. With more than 200 projects in at least 50 countries, they already dominate the global hydropower market. While environmental concerns are growing

within China, the Three Gorges Dam is still being used as a showcase to demonstrate the capabilities of the country’s dam builders. In recent years, government delegations from Congo, Nepal, Pakistan, South Africa and many other countries were invited to visit the dam on the Yangtze River. people in China. Many of these people remain impoverished. As the Three

Gorges Project was being completed, the negative impacts of dam building became ever more evident to China’s government and society. After the turn of the century, non-governmental organizations began to champion environmental protection, and farmers stood up against projects which did not respect their interest. In 2005, more than 100, 000 people protested the construction of the Pubugou Dam in Sichuan Province. In September 2007, senior officials warned that the Three Gorges Dam could turn into an environmental “ catastrophe. ” The current Chinese government appears to be less enthusiastic about large dams than its predecessors.

Prime Minister Wen Jiabao suspended the construction of several dams on the Nu River in 2004, and again in 2009. Neither President Hu Jintao nor the Prime Minister attended the inauguration of the Three Gorges Project. This has led to speculation that the current government intends to treat the dam and its many unresolved problems as a legacy of past governments. the wAy foRwARD In recent years, China has renewed its efforts to improve energy efficiency. The country is on track to improve its energy intensity by 20% under the current Five-Year Plan (2006-2010).

Its Renewable Energy Law has also set the world’s most aggressive, legally binding target. By 2020, 15% of all energy – or 137, 000 MW – is to come from wind, biomass, solar and small hydropower projects. “ It would have

been cheaper, cleaner and more productive for China to have invested in energy efficiency [than in new power plants]. ” — Douglas Ogden, Energy Foundation China is still using energy relatively inefficiently. The efficiency of Chinese electrical motors for example, which consume more than half of the country’s power, is 10-30% lower than international standards.

Successive governments have made great strides to improve energy efficiency, and energy demand has grown less fast than the economy throughout the 1980s and 90s. Pressure to maximize economic growth reversed this positive trend between 2001 and 2005. Improving energy efficiency during this period could have obliterated the need for the Three Gorges Dam – and at a lower cost. “ It would have been cheaper, cleaner and more productive for China to have invested in energy efficiency [than in new power plants],” comments Douglas Ogden of the Energy Foundation’s China Sustainable Energy Program.

China is investing hundreds of billions of dollars in renewable energy, and has become a global leader in wind and solar energy. The country’s wind power capacity is expected to exceed 100, 000 MW by 2020. A Harvard University research team estimated that over the next 20 years, wind farms with a capacity of 640, 000 MW could be installed to generate affordable electricity. The Chinese government should continue its efforts to promote renewable energy, and deserves international support in making the economy more energy efficient.

The loopholes in China’s environmental protection laws should be closed. Now that the Three Gorges Project has been completed, its impacts should be comprehensively evaluated and addressed before more mega-dams are

built. The Chinese government began to make retroactive payments to millions of people who were displaced in the past in 2006. The people who were resettled for the Three Gorges Dam should benefit generously from this program. join u s! for more information, visit international Rivers’ website: www. internationalrivers. org/en/node/356