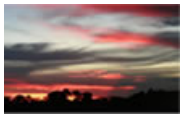
Is Hydroelectric Development an Opportunity, or a Catast?



The `War Between Fire and Water´ Continues: Is Hydroelectric Development an Opportunity, or a Catastrophe?

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“Hydroelectricity is only renewable within its life cycle; after its life cycle, it is no longer sustainable. If today's hydropower technology was like Sichuan's Dujiangyan irrigation system—creating weirs by digging canals and relying on water flow of the water to move silt—then that is indeedit would be sustainable. But in the era of tall dams, there is an inevitable life-cycle problem: once dams are choked with silt, what functions do they have left to speak of?”

“[Developed Western countries] turn around and reflect after they've finished developing—it's like the difference between reflecting upon how to bring up a child after she is already grown versus right before she is born: these are two completely separate tasks. Currently, developed countries are discussing the problem of flooding and opportunity, but, to many less developed countries, floods are anything but an opportunity—they are disasters.”

The 'war between fire and water' is coming to a head once again. In a recent public statement, the deputy director of the Department of Pollution Prevention and Control of the Ministry of Environmental Protection (MEP), Ling Jiang, directly stated that 'it is possible that, taken to a certain level, hydroelectricity could cause more serious pollution than thermal power.' This remark was immediately refuted by Zhang Guobao, the director of the National Energy Administration (NEA).

Many years ago, some environmentalists began to raise their voices in opposition to hydroelectricity. Now, against a backdrop of increasingly rapid development in hydropower generation, arguments are occurring directly between MEP and NEA officials.

So how are we to evaluate hydroelectricity's impact on the environment? With China facing enormous pressure to save energy and reduce emissions, what are the current and future prospects for hydroelectric development? *Southern Weekly* invited five experts to share their views on the subject: MEP Department of Environmental Impact Assessment inspector Mou Gaungfeng, China Institute of Water Resources and Hydropower Research Vice President Jia Jinsheng, former director of the Water Resource Protection Bureau at the Changjiang Water Resources Commission Weng Lida, dean of the School of Environment & Natural Resources at Renmin University of China Ma Zhong, and China Energy Net CEO Han Xiaoping.

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Weng Lida, former director of the Water Resource Protection Bureau at the Changjiang Water Resources Commission

Southern Weekly: One of the environmental threats posed by hydroelectric development is the effect that damming large rivers has on the hydrology and biodiversity of the river basin. To this point, opponents of dams say that we should 'keep the natural flow of rivers,' while advocates of dams emphasize the positive effect that water conservancy facilities have had on humankind. Behind all this is a question of values: are fish as important as people?

Mou Guangfeng: This is a question of value orientation and value judgment. Some people will say: in the end, aren't we just talking about a few fish? But we aren't talking about a few fish, we are talking about the ecology they represent, and that ecology is priceless.

Jia Jinsheng: The question, are people important or are fish important, is ridiculous. If you put people who say that fish are important in the position of watching their own family members compete with fish for survival, they would wake up immediately. If you don't have a family you don't know how expensive it is to raise one; in the end, what comes first are the pressing needs of the largest group of people.

China's most fundamental determinant currently lies in the state of the country itself, in trends in economic and social development. We are an underdeveloped country, the distribution and capacity of resources are thus: demand for energy, water, grain and all types of basic infrastructure is far greater than our current capacity. We definitely need to continue building up our reserves.

Weng Lida: Take the Gezhou hydropower station for example. After construction was complete, because the dam didn't leave any place through which fish could pass, there was no way for the Chinese sturgeon to survive. Now, in the upper reaches of the Yangtze River, the white sturgeon, Dabry's sturgeon and Chinese hillstream loach are all endangered, and the first two are virtually extinct. Although we may try to incubate more eggs and supplement the population, we cannot replace the natural processes of growth and reproduction. Some fish evolve, but the objective reality is one of steady decline. The Yangtze River is a treasure trove of aquatic life; its biodiversity is second only to the Amazon River, and large-scale hydroelectric

development has a great impact on this.

Han Xiaoping: After hydroelectric stations are built, a new ecological balance will take shape. Animals are very intelligent, and they can adapt to survive. Wind power also has considerable environmental costs—have you looked at how many birds are killed by wind turbines each year? The construction of small to medium-sized hydroelectric stations will not cause too great an ecological disaster. Some people will always be worried about the fish, but actually many rivers were originally seasonal and many fish would die each year without having the opportunity to mature. If we build a reservoir, maybe these fish would survive. There are always some people who would like to make the clocks stop and to maintain perfect harmony, but nature itself is in a constant state of flux—how can you define balance in such a state? This is a self-contradictory statement. How can one say that the lives of fish today bear any resemblance to those of one thousand years ago? Even if we don't build dams, our rivers, lakes and seas will keep on changing.

Ma Zhong, dean of the School of Environment & Natural Resources at Renmin University of China

Southern Weekly: Europe and the United States have hydropower development rates of 70%; China's is less than 30%. That said, the ecology of China's water-rich western region is both fragile and rich in biodiversity, At least in this respect, is China's hydroelectric development potential unique?

Jia Jinsheng: For a population of about 300 million, the United States has runoff (the amount of water passing through a certain section of a river within a certain period of time) of about 2.9 trillion cubic meters per second and reservoir capacity (the water storage capacity below a certain water level or between two water levels of a reservoir) of 1.3 trillion cubic meters. Our population is 1.3 billion, but we only have 2.8 trillion cubic meters per second of runoff and a reservoir capacity of 600 billion cubic meters. We've asked our Americans counterparts why they need so many reservoirs for so few people, and they said they just want to increase the efficiency of their water resources.

Han Xiaoping: This is not a very scientific statement. Where in the world is the ecology not weak? Where is the ecology strong? The question is whether or not a

new equilibrium is capable of being reached. It's not possible for hydroelectric development to have no negative consequences whatsoever; the crucial point is whether or not, from a systematic viewpoint, these negatives elements can be borne by the natural environment. Even without hydroelectricity, seasonal variations in water levels can still result in sludge and greenhouse gas emissions.

Jia Jinsheng, vice president of the China Institute of Water Resources and Hydropower Research

Southern Weekly: Since 2003, China's large-scale, central government-owned energy companies have been racing to claim water resources in southwest China. This has caused a lot of anxiety in the industry over the current state of China's hydroelectric development: disorderly development, procedural chaos and over-exploitation. What are your views on this?

Weng Lida: The big five energy companies are always fighting over land, and, once they grab a piece, if they don't develop it, someone else could come along and take it. Because of this, basic work in the initial stage is not good enough, geological explorations are not good enough, and construction is already underway. Problems of a lot of hydropower stations were only discovered when construction started. There have been lessons in hydrological engineering; people who have been to Sichuan's Minjiang River all shake their heads and say: if you take a large portion of a river and run it dry, it will affect groundwater, vegetation, ecological systems—all of this is undesirable.

Where can we develop; where will development be difficult; where do we start; where to we finish; these things should have been planned, but now they are all at the whim of ministerial and local interests.

Jia Jinsheng: People are living creatures, they should be dynamic when they look at these problems. Speaking of excessive, some Western development methods are more excessive than our own, while methods of finding solutions are worse. We need to continue to make the best of the advantages of being underdeveloped and do our best to improve.

Mou Guangfeng, inspector for the Ministry of Environmental Protection's Department of Environmental Impact Assessment

Southern Weekly: Another worry felt by the industry is that as China's hydroelectric projects accumulate over time, the original life expectancies and functionalities of major dams will diminish. How do you see the future prospects of these hydroelectric stations?

Ma Zhong: I support Ling Jiang's comments. Hydroelectricity is only renewable within its life cycle; after its life cycle, it is no longer sustainable. If today's hydropower technology was like Sichuan's Dujiangyan irrigation system [which dates back to the 3rd century BC]—creating weirs by digging canals and relying on water flow to move silt—then it would be sustainable. But in the era of tall dams, there is an inevitable life-cycle problem: once dams are choked with silt, what functions do they have left to speak of?

Han Xiaoping: When they were building the Sanmenxia Dam [in the Yellow River in Henan province], Soviet experts did not have a lot of experience, but now even small waves are enough to flush out sediment. Technology offers relief. The Ertan Dam[in the Yalong River in Sichuan province]doesn't have any problems with silt; if silt can build up it can also be cleared out.

Jia Jinsheng: Demand determines life. Based on China's current economic and social demands, I believe that major dams like the Three Gorges, Xiaolangdi [in the middle of the Yellow River] and Ertan will continue to play a major role 100 or even 200 years in the future. I can't foresee any reason why they would have to be taken down. In fact, the Three Gorges Dam will continue to play a major role for the next 500 years.

This is a historical process. Developed countries in the West are about 20-25 years ahead of us in development. Now they turn back and reflect and think that they should be more concerned about the environment. Around the year 2000, as this reflection reached its zenith, shock waves were felt throughout developing countries, as they believed that the West had already reached the stage of opposing and tearing down dams. However, this was a massive misunderstanding.

[Developed Western countries] turn around and reflect after they've finished developing

—it's like the difference between reflecting upon how to bring up a child after she is already grown versus right before she is born: these are two completely separate tasks. Currently, developed countries are discussing the problem of flooding and opportunity, but, to many less developed countries, floods are anything but an opportunity—they are disasters.

As a developing country, ourwater conservancyfacilities still have not reached a level of surplus and high quality. From a global perspective, our per capita reservoir capacity and installed hydroelectric capacity are in step with our stage of economic development, neither surpassing nor falling behind. Investment in water management facilities actually needs to be increased.

Han Xiaoping, CEO of China Energy Net

Southern Weekly: China's 12th Five-Year Plan intends to vehemently develop hydroelectricity, mainly in consideration of China's high proportion of thermal power and desperate need to reduce emissions. Some people also say that since current development of hydroelectric resources is causing unavoidable resettlement and environmental problems, we could develop other renewable energy sources. In your opinion, are there solutions besides hydroelectricity?

Jia Jinsheng: Hydropower is typically RMB 0.10 cheaper than thermal power. Solar energy currently has no market advantage, so from an industry perspective, its not very economical. The market for hydroelectricity is quite strong, and, if policy liberalizes, then it's growth will be even faster. Is it because of hydroelectricity that rivers dry up? No, it's because there are too many people and they use the river dry. China has already destroyed so many rivers, but in which case has hydroelectricity been the cause?

Mou Guangfeng: The main problems now are that emissions are quite high and that the demands on energy resources are consistently high. For these reasons, hydroelectricity has risen in importance. Hyropower and thermal power cannot be compared so easily. It's like comparing Chinese chess and Go; can you say which is good and which is bad? Thermal energy's main impact on the environment is the emission of pollutants. Hydropower's biggest impact is changes to aquatic ecosystems.

When a thermal power plant is shut down, new emissions are also ceased, but, once a dam is built, even if it is producing no electricity, it still has an effect on the hydrology of the river, and this effect is very difficult to reverse. Rivers can be used for many things, the most important being drinking, followed by irrigation, cultivation, generating electricity, shipping, regulating ecology and local climate, tourism, industry, and so on.

How intensely a river is exploited should be considered comprehensively and measured by more than a single norm. In reality, our river utilization is relatively high. Some development purposes can be carried out concurrently, while others are exclusive. As much as possible, we need to express the comprehensive functions of rivers, rather than emphasize one particular function and ignore all of the rest.

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