III. The BRICS—The Next Stage of Mankind

Create Water Resources—China, the World Model

by Marcia Merry Baker

April 13—China is the world model for commitment to providing and utilizing an increasing water supply, based on the principle that "natural" resources are man-made. China is the leader in both geo-economic projects to make available more water from existing resource patterns on Earth, and in pursuing advancement in space research, to gain the knowledge and means to intervene in planetary moisture cycles, to improve the resources of the Earth. The measure? Progress of mankind.

China completed the Three Gorges Dam, the world's largest, in 2008. China has completed, as of 2014, the first two of three water conveyance channels, for the South-North Water Diversion Project, the world's largest. The nation is proceeding on nuclear power, with 28 reactor stations under construction, and a goal of tripling its nuclear capacity by 2020. There are key initiatives for nuclear-powered seawater desalination. In 2013, China landed its rover, Yutu, on the Moon—signifying its general drive for space research, essential to the future of life on Earth.

CC/Pedro Vásquez Colmenares

The Three Gorges Dam, largest in the world, opened in 2008; it generates 22,500 MW, and provides flood control.

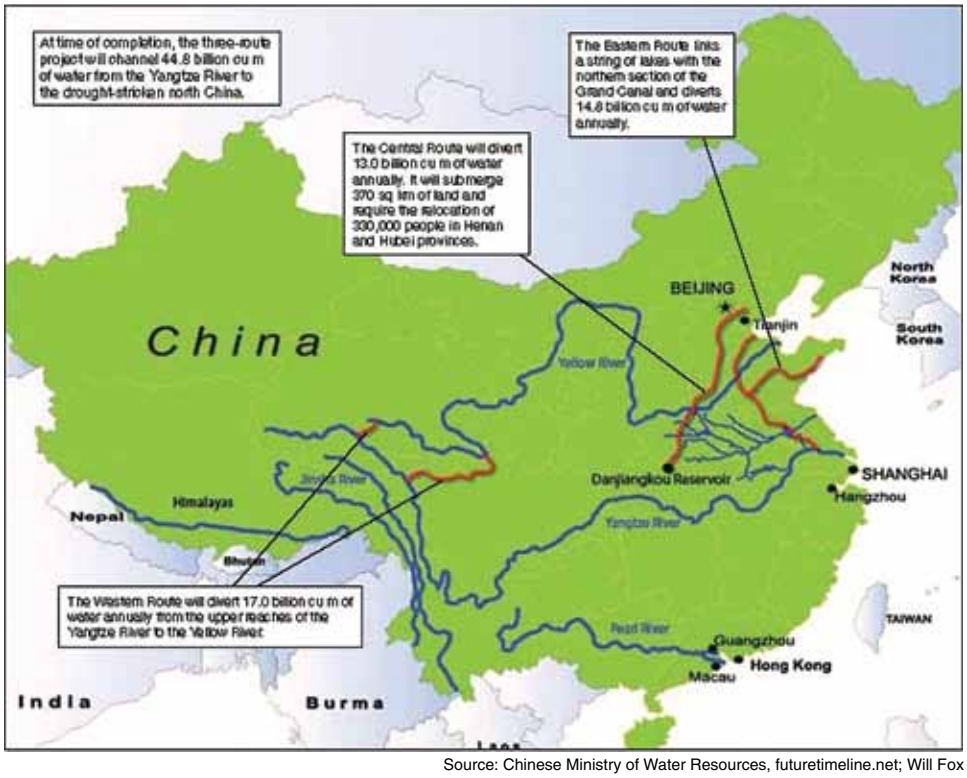
These actions by China are critical for the United States, which, across the Pacific, is facing doom for refusal to take necessary measures to create more water. The United States urgently needs to collaborate with China on all aspects of water policy, from space science to infrastructure engineering.

China's emblematic, outstanding water infrastructure project—the Three Gorges Dam—is not only an instructive, "Extreme Engineering" success, but it is an inspiration for all humanity. It shows the mind-of-man at work.

South-to-North Water Diversion

In December 2014, the first "new water" began arriving in water-short Beijing from the Central Route of the grand South-North Water Diversion Project (SNWD), a three-route scheme for diverting flow northward to the water-deficient North China Plain, from the various parts of the water-plentiful Yangtse River Basin. This Central Route system takes water north through some 1,200 km of channels and pipes, from its southerly origin in the middle reaches of the Yangtze River Basin. In December 2013, the Eastern Route of the SNWD was opened, and is now taking water from the lower basin of the Yangtze, northward to the lower reaches of the Yellow River. This Eastern Route follows China's ancient Grand Canal. The Western Route is still in the planning stages.[1]

FIGURE 1
South-North Water Diversion Project



Source: Chinese Ministry of Water Resources, futuretimeline.net; Will Fox

Figures 1 and 2 show national maps of the situation: the highly uneven rainfall pattern; and the schematic picture of how the SNWD routes are designed to move water from the regions of water abundance northward, to regions of scarcity.

The far northwest of China is a continuation of the desert drylands from north Africa, across Arabia, thence spanning Southwest and Central Asia. This aridity pattern decreases eastward, as the monsoonal effect comes into play, to the point of very high rainfall in Southeast China. The great Yellow River (Huanghe) in Northern China, courses through drylands and loess formations, and in several places, its river bed is higher than the surrounding plains! The long Yangtze River, rising in the highlands of the Tibetan Plateau, has a large catchment area, with a sizable flow, emptying at Shanghai, into the sea.

Diverting plentiful water northward has long been discussed, most seriously after the 1949 Revolution. Then, in 1958, the Yellow River and Yangtze River Commissions began to study seriously the possibility of sending water north, and investigations were continued for over 40 years.

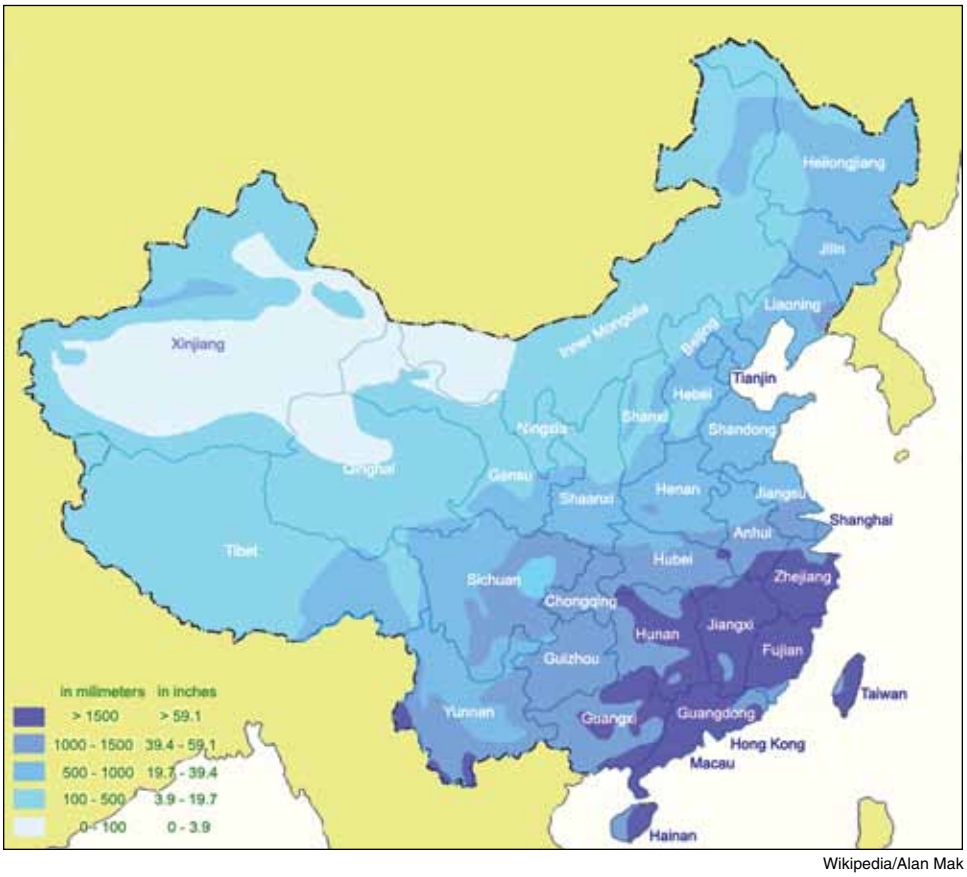
In 2002, the China Water Resources Ministry announced that construction would commence. Zhang Jiyao, Vice Minister of Water Resources, said at a November press conference that year, that the new project would create three new man-made "rivers." He said it would be carried out as a "mega-project that is strategically aimed at realizing the optimal allocation of water resources" in China.

With the future completion of the western diversion route, the total SNWD system, when complete, will be transferring 44.8 billion cubic meters of freshwater to the parched north. (Compare this with the total annual flow of the Yangtze, which is 600-950 bcm). This is vital for Northern China, where amost 60% of China's farmland is located, and 45% of its population lives. However, it was known from the start, that it would not be enough.

What characterizes the SNWD, the Three Gorges Dam, and other big projects in China, is the commitment to seeing them through as a continuing process. In September 2014, when the sluice gates on the Central Route system were ceremonially opened for the first

1. Mary Burdman, "China Opens the Floodgates: Huge Project To Address Water Scarcity," *EIR*, Oct. 31, 2014.

FIGURE 2
China—Great Disparity of Rainfall
(Average Annual Precipitation)



Wikipedia/Alan Mak

time, a national water spokesman stressed to CCTV, "We know this won't solve everything. We will still need more water. But we will solve that in the future."

That makes the many "firsts" and "records" set in the course of constructing the SNWD, all the more delightful. In Beijing itself, which is receiving two-thirds of the Central Route water, extensive underground storage and transmission facilities were built, sometimes at a depth of 15 stories.

The world's largest aqueduct is on the new Central Route. It carries Central water overtop the Tuanhe River, at a flow of 420 cubic meters per second. The structure is "built to last a century," the senior engineer Yu Pengtao told CCTV last Fall. "This aqueduct is no doubt the number one such structure in the world, in regards to water capacity, scale and weight. The design requires high precision and a scientific approach."

The Central Route flow has to cross some 170 rivers, in the watersheds of the Yangtze, Huaihe, Haihe, and the Yellow rivers. Engineers designed aqueducts, canals, and tunnels to deal with this, their plans driven not simply by hydraulics, but to minimize intermingling of freshwater with polluted water. Reduction of pollution of water, land, and air is a major goal and necessity in China today.

At the same time that progress on the SNWD proceeds, other water infrastructure projects are underway. In June 2014, the third-largest dam in the world was opened, the Xiluodo Dam on the upper stretch of the Yangtze River. In July 2014, the world's sixth-largest dam, the Xiangjiaba, opened, also on the upper Yangtze. China alone now has more large dams than the rest of the world combined.

'Desalination Cities'—Nuclear Power

China is moving staunchly on seawater desalination, with important initiatives for nuclear-powered desalination, toward a future massive scale. In February 2012, China's State Council set a desalinated water target for the 12th Five-Year Plan (2011-15), including a program to build a chain of desalination facilities along the dry northeastern coast. This involves sites from Shandong to Liaoning. The list was expanded in 2013, when the National Development and Reform Commission announced the addition of new coastal cities.

Currently, the overall target set by the central government's Special Plan for Seawater Utilization calls for a fourfold increase—up to 3 billion liters—by 2020, in the country's current capacity. Work is underway on both non-nuclear and nuclear desalination.

On the shore of Bohai Bay, for example, construction has started on a thermal desalination plant near Tangshan, part of whose output—planned to begin in 2019—will then be piped 270 km to Beijing. Work on this new water pipeline has begun. The project is being done jointly by the Norwegian firm Aqualyng, and the Hong Kong-based Beijing Enterprises Water Group.

There are projects at other points along the chain of "desalination cities," at various stages of progress. These include Dalian, Qingdao, Shenzhen, Shoushan, Luxixiang Island in Zhejiang Province, Binhai New Area in Tianjin, Bohai New Area in Hebei, and a number of industrial parks.

The chain of "desalination cities" also includes pre-existing de-salting operations, for example, at the port city of Tianjin, where the Dagang coal-powered plant has been producing 3,000 cubic meters a day for 15 years for cooling, with a U.S.-designed multi-flash (MSF) unit. The Tianjin Beijing Power and Desalination Plant, specially designed and built by Israel's IDE Technologies, is one of the world's largest thermal plants using multi-effect distillation (MED), and the largest desalination plant in China. It began operating in 2010, and produces 200,000 cubic meters a day, about one-third of China's current desalinated water output.

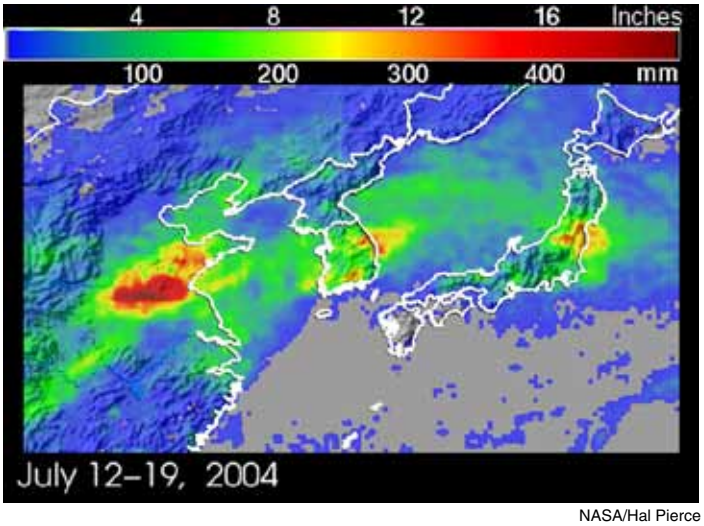
Nuclear power is the precondition for mass-scale desalination of seawater and inland brackish water, which is needed at many locations across Eurasia. At present, China has 21 nuclear power stations (the first went on line in December 1991), with 28 more under construction. Although by percentage of type of power generation, nuclear will still be under 10% of China's power base when the project is completed (contrasted to the U.S. at 20%, or France at 50%), the commitment to a nuclear future is clear.

There are some nuclear desalination initiatives. The new Hogyanhe nuclear power project in the northest, at Dalian in Liaoning Province, undertaken by CGN (China General Nuclear Power), will use waste heat to desalinate 10,080 cubic meters of seawater per day, to provide its cooling heat. Chinese authorities are looking at a seawater desalination facility on the Shandong Peninsula, in the Yantai area, to produce up to 160,000 cubic meters a day by MED, using a MWt (thermal megawatt) NHR-200 reactor.

Water from Heaven

China's leading role for advances on Earth is exemplified by the December 2013 landing on the Moon, by its rover, the Yutu (Jade Rabbit), after an almost 40-year pause in mankind's activity on the Moon. This successful project reflects China's commitment to seek maximum knowledge of, and dominion over, the processes of our universe. China has put forward its next immediate steps in a 2014 statement, "Lunar Exploration Program." There is work underway for a lunar base of operations, with a focus on new energy development, and circumstances for living, as a base for further space probes.

FIGURE 3
NASA Satellite Image: Monsoon Hits East China



NASA/Hal Pierce

China's initiative and effort constitute the means—through new instrumental readings, new insight and thought—to reach to a higher understanding, in particular, of the dynamics of Earth's water cycles. This can be the basis for modifying what have seemed to be intractable climatic patterns, to the lasting benefit of all.[2]

China itself is hostage to a fierce pattern of dryness in the west and north, while being pelted in the southeast by the Summer monsoons. The NASA image shown here (**Figure 3**) is a satellite view of a monsoon centered on eastern China. It captures a rare instance (July 2004) in which a big monsoon went even farther north from its typical range—still not as far as Beijing—-and dumped more than 16 inches of rain (red) in just a week.[3]

Across the Pacific Rim, the United States West is also drying out, a hostage to the phenomenon of the Pacific atmospheric river (the "Hawaiin Express") flowing in from the ocean, but not regularly dropping its rainfall potential on land.

Hoping for a monsoon, or praying for rain, isn't a viable policy. Being able to direct or influence these large water dynamics is the future. The China space policy is the commitment to progress that can ultimately bring rain from Heaven.

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2. Benjamin Deniston, "Solve the World Water Crisis," *EIR*, Jan. 30, 2015.

3. See NASA, Tropical Rainfall Measuring Mission (TRMM), which utilizes the near-real-time MPA—Multi-satellite Precipitation Analysis for rainfall estimates over the global tropics.