

Greening the Desert In Northern China

by William Jones

Hundreds of experts gathered in Urumqi, China, on Nov. 5, to discuss a proposed project to bring the water of the Bohai Sea in China's northeastern Liaoning province, to the dry northwestern areas of Gansu and Xinjiang. The conference was entitled "Moving Seawater West: Bringing Bohai to Xinjiang"; it was sponsored by Xinjiang University, with participation of two provincial Development and Reform Commissions.

The main problem facing China's long-term development is water distribution. China has a great and long-untamed Yangtze River, which, with the successful operation of the Three Gorges Dam (largely completed in 2008), is now more under the control of man. China has 17,700 kilometers (11,000 miles) of coastline, along which much of the last decade's rapid economic development has occurred. But in the West and the North, water is a precious and elusive commodity (**Figure 1**).

The problem is getting worse. While most people don't realize it, a large portion of the land-mass of China is desert—more than 27%, or 2.5 million square kilometers. (Just 7% of Chinese land feeds about a quarter of the world's population.) According to official reports, each year 6,475 km² of land turns to desert, and 800 km² of railroad and thousands of kilometers of road are blocked by sand. Each year when the winds pick up, the large sand dunes forming just 70 miles west of Beijing make life difficult for the capital's inhabitants. Some scientists estimate that, if the present conditions continue, Beijing could be silted over within a matter of years.

The Chinese have been masters of irrigation for millennia, bringing the

water from where they find it to where it is needed. The famous Dujiangyan channel (256 B.C.) was an ancient example of Chinese water management capabilities, and it is still used today as the central point of the irrigation system that nourishes the fertile Sichuan province.

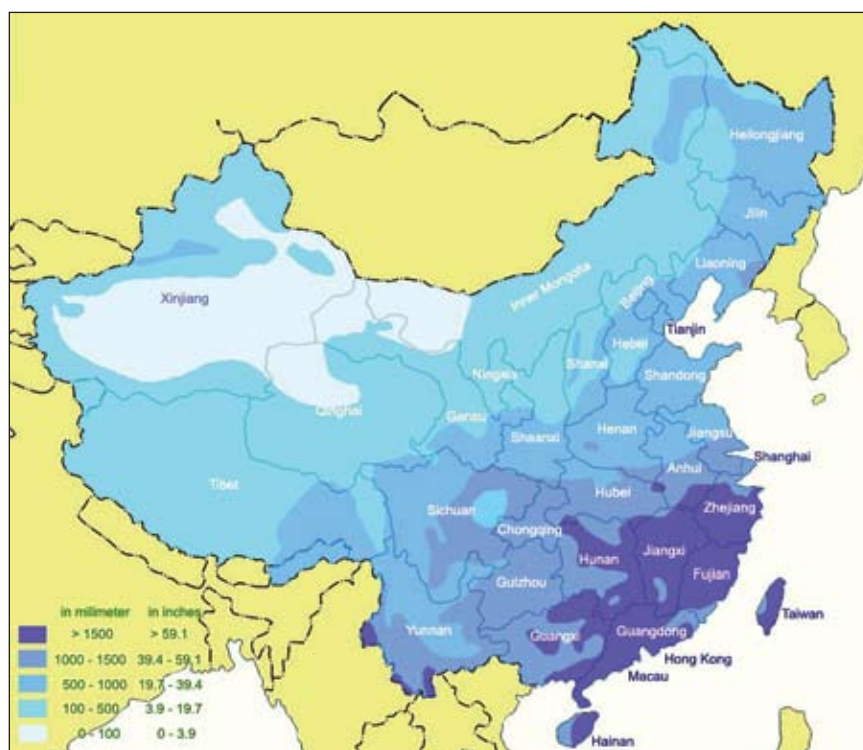
Massive Projects

China has already advanced on one major water diversion project, "South Water Northward," which will bring water from the Yangtze, north to the sprawling metropolis of Beijing and nearby Tianjin, and for irrigation in the desert region west of Beijing.

Furthermore, in the last few years, the idea has been circulating, which was hotly debated at the Nov. 5 Urumqi conference, of transferring water from the Bohai Sea to Xinjiang (**Figure 2**).

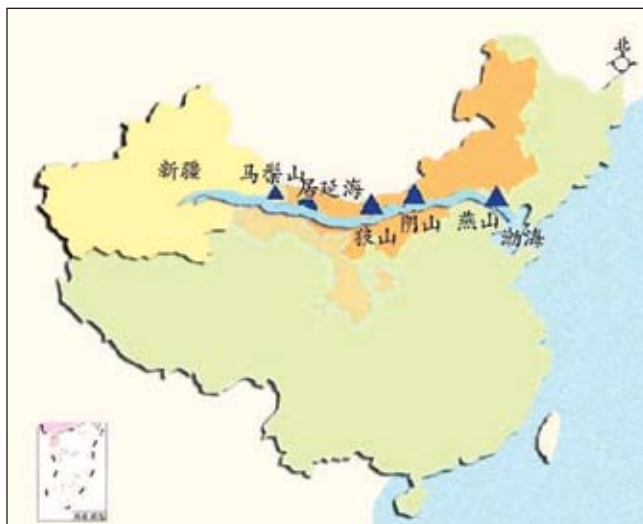
According to one version of the plan, seawater from Bohai would be used to fill the long dried-out lakes, rivers, and channels in Xinjiang and Gansu provinces. The water can then be used for growing desert plants, and as water from these lakes start to evaporate, it will promote cloud formation and increase precipitation, changing the character of the biosphere in the area. Al-

FIGURE 1
China's Average Annual Precipitation



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FIGURE 2

Proposed 'Bohai Water Westward' Plan

The route proposed by Prof. Chen Changli, passing close to the border of Inner Mongolia.

though not nearly as ambitious as the North American Water and Power Alliance (NAWAPA) project, recently revived by Lyndon LaRouche and the LaRouche Youth Movement, China's "Bohai Water Westward" is based on a similar philosophical outlook.

The project was originally formulated by Prof. Huo Youguang of Xi'an Communications University and Prof. Chen Changli, the director of the Chinese Geophysical Society. Although the two came upon the idea independently, and have somewhat different visions of which route the water should take, the basic concept is the same: to transport water from the Bohai Sea to the desert area in Xinjiang.

Prof. Huo Youguang recently explained to *China Economic Weekly* how he developed his proposal. He was sitting in the Beijing West Railway Station gazing at a large wall map of China, and suddenly it hit him! He saw the eight great deserts in the west, including the Taklimakan and Gobi, and the Bohai Sea in the east. He traced the distance with his finger. They weren't terribly far from each other, he thought.

Huo knew the area well, having traveled there extensively as a geological engineer. He knew the value of water there: Sometimes he would have to use a cup of water in the morning to brush his teeth, and then use the same water at night to wash his face. He thought in particular of utilizing the existing lakes and the largely dried-up Shule River in Gansu province, one of the few

westward flowing rivers in China, to transport water to Xinjiang. He published a book *China's Water Policy Solutions*, in 1997, and numerous papers elaborating his idea.

At about the same time, Prof. Chen Changli began to advocate a similar project, publishing a number of papers on the topic between 1999 and 2004. Chen, a member of the Chinese People's Political Consultative Committee, the main advisory body to the legislative National People's Congress (CPPCC), took the issue up at the 2001 meeting of the National Committee of the CPPCC.

Outlines of the Proposals

Moving from east to west through Gansu and Xinjiang, you are moving from a higher altitude to a lower one, thus allowing a great deal of "gravity-assist" in bringing the water to the dry region. The route proposed by Professor Chen would take the water from the northwest coast of the Bohai Sea to the southeastern part of Inner Mongolia, through the Yan and the Yin mountain ranges, coming out northwest of Lang Mountain into Juyanhai, bypassing the Mazongshan Mountains, and from there into Xinjiang. This route follows closely along the Sino-Mongolian border, traveling through a more populous region, and twice crossing the Yellow River.

But Professor Huo worries that this route, bringing the water through a largely grassland area, would inevitably result in increased salinization of the soil, and would require considerable engineering achievements to secure a steady flow. He favors a plan to take the water from the mouth of the Bohai Sea near Tianjin, through pipes made of glass and plastic, to an altitude of more than 1,280 meters above sea level at Lake Huangqi. Huo calculates that one ton of water raised 200 meters requires 1 kilowatt hour of energy, or 6.4 kWh for the full 1,280 meters. Then, using anti-seepage canals and small-scale step-up works (such as reservoir ponds to increase elevation) to extend the natural flow distance, the water will ultimately reach the Shule River near Yumen, Gansu. Utilizing the basin of the Shule River, the water will flow naturally toward the eastern border of the Tarim Basin at Lop Nor. Along the way, the water can be utilized to refill some of the dried out lakes and rivers that dot the region. Huo calls this route the "interior line" option. It would take the water directly through the eight great desert regions of the area, to fill many of the basins and ravines with water.

Technical Issues Raised

There are many technical issues that remain to be overcome, and the project remains contentious within the Chinese academic community. While it has strong support from the Xinjiang and Gansu regional authorities, the Beijing government has not yet given its support to the project. Professor Huo, Professor Chen, and other proponents of the project are spending a good deal of time dealing with objections, and looking for solutions to criticisms that may be valid.

There are also critical voices being raised by radical environmentalists, whose purpose is to shoot down this valuable project, no matter what. Probe International, which had also strongly opposed the Three Gorges Dam, is beating the drums about an “ecological catastrophe” if such a project were realized.

The first technical issue involves possible soil salinization. Will not the thousands of tons of seawater seep into a soil that is already plagued by that problem? And how will the seawater be desalinated? Professor Huo explained to *China Economic Weekly*: “Seawater desalination in China at present is no technical ‘bottleneck.’ The current filtering method we use is the use of semi-permeable membrane to achieve separation of the role of freshwater and salt.”

Huo is confident that seepage is much less of a problem in a desert region than in other types of soil, such as grasslands. He points to some salt deserts in Qinghai which have not affected surrounding regions by an accumulation of salt. “In the desert,” he says, “there is a thin layer of sand, and underneath there is hard rock.” The seawater will remain in the basin in which it is placed.

Another question is, will any clouds that form actually remain over the area and not be blown away? “The amount of precipitation in the northwest region depends on three necessary and sufficient conditions,” Huo told *China Daily*. “First, there are the westerlies; second, the system of condensation with high mountains; third, the

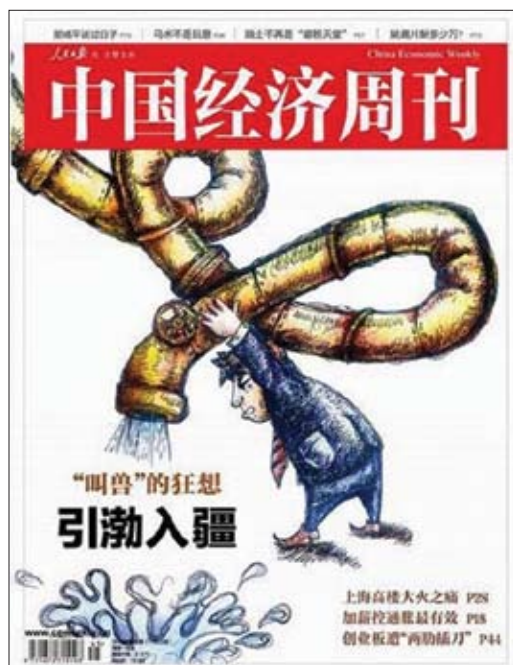
water vapor supply source. . . . To the north and to the south of the area of the ‘interior line’ are two mountain regions: to the north, the Yan, Yin, and the Helan mountains, and to the south the Tianshan, the Taihang, Luliang, Qilia, and Kunlun mountains. This creates a barrier north and south of the ‘interior line,’ allowing the vapor to remain over the area. When the water vapor rises, it will encounter the colder air in the mountains, with the subsequent formation of rain on the northern and southern slopes.”

Huo is very excited about the prospects, telling

China Economic Weekly that “‘Bohai Water Westward’ will also spur infrastructure investment.” He elaborated on the benefits of his basic concept: “The creation of artificial lakes will support the development of wetlands; you can plant alkaline-soil plants on the wetlands; desert plants can improve the pastureland; bio-engineering can be implemented, selectively breeding plants able to endure seawater, and, utilizing the vegetative cover of the desert floor, you can begin developing agriculture and husbandry. The artificial lakes will also shape local precipitation, enabling the aerial seeding of grass, and thereby stabilizing a large region of the desert, and causing the shifting sand dunes to become stable and fixed, and

finally transforming the desert into an oasis.” And given the slope of the land as you proceed westward, the flow of water could be utilized to provide power for the region, he added.

While the various technical problems associated with this project will no doubt be resolved in time, it is the economic and political situation in the world that will determine whether the project will ever be realized. Breaking the hold of the London-based financial system, and shifting toward a policy of development represented by the revived NAWAPA project, will ultimately determine the fate of this and other ambitious projects needed to secure a decent life for all the peoples of the world.



China Economic Weekly in November contained an interview with Prof. Huo Youguang, on the Bohai project.