Renewable Energy in China

19 July 2001

Debra J. Lew, U.S. National Renewable Energy Laboratory

Eric Martinot, Global Environment Facility

Song Yanqin, Chinese Renewable Energy Industries Association

By Qin Xin

Although governments (and individuals) around the world are becoming increasingly concerned about degraded air quality and global warming, many remain unwilling to sacrifice economic growth or comfortable lifestyles in exchange for a cleaner environment. The development of safe, clean, and cost-effective alternatives to conventional energy has therefore become crucial. For China, a country relying on coal—the "dirtiest" energy source—for 75 percent of its primary commercial energy use, the task to find clean energy is even more imperative. Given China is expected to become the largest energy consumer in the coming decades, how the Chinese leadership chooses to solve its energy problem will not only bear on the country's own environmental future, but also on the environment of neighboring countries, and the world. China's energy path will have strong implications for global climate change. Rich in renewable energy sources (such as wind, solar, small hydro, and biomass) China has a great potential to develop clean energy. On 19 July 2001, the Environmental Change and Security Project's Working Group on Environment in U.S.-China Relations gathered at the Woodrow Wilson Center in Washington, DC for a discussion on China's renewable energy development. Three speakers discussed the current status of China's renewable energy development, and examined problems China needs to overcome to successfully develop a clean energy infrastructure.

Debra J. Lew

An Overview of China's Renewable Energy Development

A considerable amount of renewable energy is being used in China, according to Dr. Debra Lew, a senior project leader with the National Renewable Energy Laboratory (NREL). Traditional, noncommercial biomass constitutes 15 percent of China's total primary energy use. While new, commercial renewables (wind power, solar, small hydro, biogass, and biomass gasification) represent another two percent. China has been very successful in developing small-scale renewable energy. In fact, a significant number of installed household systems and a mature industry for small-scale renewable energy are already in place. China leads the world with its 155,000 to 170,000 small wind turbines and 17 gigawatts (GW) of energy generated by small hydropower. The country also contains the world's most household biogas digesters and biomass cook stoves. Additionally, the use of solar home systems is rapidly

expanding in China, with approximately 200,000 systems already installed for rural electrification.

In contrast to impressive small-scale facilities, the development of utility-scale, grid-connected renewable energy is not as successful in China, for the market is still being developed and the industry is not mature. For example, China now has 345 megawatts (MW) grid-connected wind power, merely 1/1000th of its potential; its biomass power generation, at about 400 MW, is only one percent of that used in all other developing countries.

Debra Lew attributes the relative success of small-scale energy development in China to a combination of research and development (R & D) with institutional infrastructure development and fiscal incentives. Chinese researchers have made considerable R & D efforts on small renewable energy since the 1950s; foreign technologies also were imported and adapted to China's needs. Simultaneously, a complete institutional infrastructure has gradually been established. Most notably is the fact that 80 percent of the counties in China now have a rural energy office, which plays an important role in marketing and popularizing the new renewable energy technologies, as well as providing training and technical services. In addition, the Chinese government also has promoted the use of these energies through a series of fiscal incentives such as subsidies, low-interest loans, and preferential tax policies. All these efforts have helped bring about a mature small renewable energy industry that is driven by the market instead of government command-and-control.

Debra Lew then highlighted some of the challenges facing the development of large-scale, grid-connected renewables. While the lack of funding often is cited by the Chinese government as the greatest barrier to building large renewable energy projects, Dr. Lew believes the real problem is market distortions due to China's reliance on tied aid from some European countries. Tied aid makes it difficult for the private renewable industry to grow on a commercial scale and become self-sustaining. In addition, China's power industry is currently in the process of utility restructuring and companies are reluctant to invest in renewables which are high risk and costly investments. Another major hindrance to large-scale renewable energy development is the fact China does not have an independent power industry and the government control leads to a lack of competition and distorted power prices. The Chinese government has set up a variety of policies and programs to promote the development of renewable energy in recent years, but too often these programs create only rules and guidelines without specific measures for implementation. All these problems, as well as issues such as technology transfer and resource assessment, need to be addressed for the successful development of large-scale renewable energy.

In conclusion, Debra Lew talked briefly about international assistance to China's renewable energy development, such as World Bank/Global Environment Facility (GEF) projects, the U.S.-China Bilateral Protocol on Energy Efficiency and Renewable Energy, and the Energy Foundation's China Sustainable Energy Program.

(*Editor's Note: For more information on these projects, see the NREL inventory entry in this issue of the China Environment Series and see Fact Sheet: Renewable Energy in China on the Environmental Change and Security Project's Web site http://ecsp.si.edu)*

Renewable Energy Market Development in China

Dr. Eric Martinot of the Global Environment Facility (GEF) focused his talk on market development for renewable energy. He first compared China's renewable energy development with other developing countries. The global investment in the power sector in developing countries is about $40 billion a year, of which only $0.5-1.5 billion flows to renewable energy, and this number is expected to increase to $2-3 billion in the coming decade. Currently the developing countries have an installed capacity of 55,000 MW in grid-connected renewable energy (large hydro excluded), of which China accounts for approximately one-third (18,000 MW). China has a substantial share in small hydropower but much smaller shares in wind, solar, and biomass relative to the total amount of developing countries. With regard to off-grid and mini-grid applications, China has done extremely well in household wind and biogas systems, accounting for 90 and 70 percent, respectively, of the total for developing countries.

Eric Martinot then examined four GEF-supported wind and solar energy projects in China and analyzed lessons to be learned from these projects, as well as challenges confronting China's renewable energy market development. He highlighted the following key issues:

- Since China initiated power sector reforms in 1998 utilities increasingly act as profit-seeking commercial entities and prefer to buy cheap conventional power to higher-priced wind power. The cost difference will have to be financed in some way in order to spur domestic demand for renewable energy.
- Technology transfer has proved difficult. Foreign manufacturers often are concerned about the improved competitiveness of Chinese enterprises and thus unwilling to give away their advanced renewable energy

technology.

- International aid is sometimes used to subsidize provincial utilities to lower capital costs of their renewable energy projects. The purpose of such subsidies is to initiate a market and spur investment. However, these subsidies actually have the effect of hindering private companies from investing in renewable energy because they are left in a disadvantageous position compared with those subsidized utilities.
- High transaction cost is associated with marketing and servicing solar home systems. So far China has not been able to develop a viable consumer credit mechanism in rural areas, which severely limits the affordability of such systems and the expansion of the market, even in the energy-starved rural areas.

In his final remarks, Eric Martinot argued that market development could be greatly accelerated in China by supporting Market Facilitation Organizations (MFOs). MFOs are often joint public-private organizations that sell services to private clients but also act in the public interest with some public funds. MFOs provide a variety of services for private energy clients such as developing industry strategies, building networks, matching partners, and disseminating information. A good example of a renewable energy MFO, he noted, is the Chinese Renewable Energy Industries Association (CREIA), which was created with the support of the UN Development Programme (UNDP) and GEF.

A Market Facilitation Organization for China's Renewable Energy Development

Mr. Song Yanqin from the Chinese Renewable Energy Industries Association (CREIA) offered a brief introduction to the function and activities of his organization. CREIA was established as an independent, industry-based association in January 2000 as part of the *UNDP/GEF Project on Capacity Building for the Rapid Commercialization of Renewable Energy in China*. CREIA aims to: (1) raise awareness of renewable energy investment opportunities; (2) create a business network for professionals in the renewable energy industry; and (3) provide key policy advice to the Chinese government. CREIA's activities will be financed by the UNDP/GEF in the first three years, but the organization will gradually evolve into a self-supporting body with membership fees and other independent funding mechanisms.

CREIA defines its role as a bridge between regulatory authorities and industry professionals; a window bringing together national and international project developers and investors; and a network for its members from the Chinese renewable energy business community. To fulfil these functions, an Investment Opportunity Facility (IOF) has been created within CREIA, which will provide assistance to the renewable energy industry in China to identify, develop, and obtain financing for renewable energy projects. In addition, CREIA assists in the training of national policymakers, sector professionals, and businesses. For example, a Project Management Training Program for CREIA members and staff was held in July 2000. CREIA also works closely with regulatory authorities and business communities to develop industry standards for renewable energy technologies, such as solar water heaters.

Mr. Song concluded by stressing the importance of CREIA's role as a channel linking the government and the business sector. Such linkages combined with foreign investments and project development assistance will help promote the adoption of renewable energy technologies China.

(*Editor's Note: For more information about the work of NREL, GEF, and CREIA, please visit their Web sites: www.nrel.gov/china; www.gefweb.org; www.creia.net*)

NGO Conservation Work in Tibet and Western Sichuan

5 September 2001

Yang Xin, Sichuan GreenRiver Environmental Conservation Promotion Society

Grace Ge Gabriel, International Fund for Animal Welfare

Jake Brunner, Conservation International

By Fengshi Wu and Timothy Hildebrandt

While ecologically a rich region, western China lags far behind the coastal provinces in economic development. Though Beijing has continually reaffirmed the historical, integral position of western provinces as part of the People's Republic of China, until recently this vast area has received much less support for infrastructure and economic development than the rest of the country. While the Go West campaign promises an influx of investment, the campaign may also exacerbate environmental degradation in the region. Tibet and western Sichuan—areas with rich, yet fragile ecosystems—are perhaps the most environmentally threatened by massive development campaigns. On 5 September 2001 at the Woodrow Wilson Center, nongovernmental organization (NGO) representatives from China and the United States discussed their conservation work in this region. Though engaged in different activities, these three speakers touched on common challenges to their conservation projects in Tibet and western Sichuan, emphasizing the importance of networking, cooperative alliances, engaging government agencies, and the value of targeting small areas for conservation work.

Yang Xin

Sichuan GreenRiver Environmental Conservation Promotion Society

The rich diversity of western China's ecosystem and its threatened existence are well exemplified by the Yangtze River. The world's third largest river originates in the Qinghai-Tibet Plateau, once referred to as the "third pole" because of its extremely frigid temperatures. Created from melted glaciers, the river traverses 3,915 miles of varied terrain until it flows into the Yellow Sea. The river serves as home to a diverse collection of wildlife and provides a livelihood for millions of people. Yang Xin—the founder of Sichuan GreenRiver Environmental Promotion Society—has focused his environmental work on the upper reaches of the Yangtze.

Augmenting his presentation with slides of the region, Yang Xin profiled the unique ecosystem of the Yangtze headwaters, the problems it faces, and his work to maintain the sustainability of the area. Yang Xin began with photos of the plateau wolves. Once living in great numbers across the plateau, the wolves have fallen victim to the cattle industry. The cattle herdsmen have singled out wolves as a direct threat to their economic well being and the viability of the industry. With the encouragement of the government, herdsmen have slaughtered the wolves—sometimes with the promise that evidence of the kill, a wolf tail, can be traded for the delicate meat of a sheep's head. While herdsmen enjoy less threatened cattle herds, and the occasional sheep's head, a new problem has arisen. Rat and rabbit populations, natural prey of the plateau wolf, have multiplied, leading to widespread grassland degradation.

Grasslands also have fallen victim to global warming. Yang Xin noted that the plateau is losing grassland at a rate of two percent a year while glaciers diminish nearly 20 meters annually. Land degradation is forcing those who make a living on the land to move to higher locales. Yang Xin showed one photo of a young girl who was tending to cattle at an altitude of over 5,000 meters—biologically, the highest possible altitude for plant growth and the last option for herdsmen to maintain their subsistence. Quite literally, residents of the plateau are being pushed to the limit.

The Qinghai-Tibetan Plateau shares other great environmental problems with the rest of western China—poaching and deforestation, which pose a considerable threat to local biodiversity. Most notably, Yang Xin reminded the audience, is the plight of the Tibetan antelope. Hunted for their fur that is manufactured into pelt shawls known as "Shahtoosh" and sold around the world, the antelopes are being slaughtered at an estimated rate of 20,000 per year. After 40 years of continuous logging once pristine forest regions on the plateau have been considerably degraded. Such excessive logging has caused soil erosion, which directly contributed to severe floods in the lower Yangtze in 1998.

Yang Xin's environmental work began with the writing of the book *The Spirits of the Yangtze*. Serving as a documentation of his personal exploration, photographs, and a profile of environmental protection activities in the region, the book's sales succeeded in raising funds for the establishment of a nature conservation station at the headwaters of the Yangtze. The conservation station will fulfill several needs:

- Hosting scientists to conduct research and investigations in the region;
- Recruiting volunteers, based in the station to engage in environmental advocacy and training activities;
- Serving as a model of natural conservation for the local population by exclusively using wind and solar power for energy needs;
- Promoting environmental education among tourists traveling along the Qinghai-Tibet Highway; and,
- Issuing reports on wildlife conditions to state agencies.

Four years since establishing the conservation station, it remains the only one of its kind in the region and is the only ecological monitoring station run by an NGO in China. GreenRiver has recently set up a second station in the region. At a cost of $30,000 per year, the stations are expensive to operate and will need external support to continue the work. Book sales alone cannot support these stations. Yang Xin views the stations and his NGO as a work in progress. As a scientific research-based NGO that provides policy recommendations to government and also works to raise ecological awareness at the community level, Yang Xin hopes that GreenRiver can discover a more effective means of promoting environmental advocacy across China—"Environmental activism with Chinese characteristics." The future of environmental protection in China, Yang Xin claimed, lies in productive partnerships between the government and environmental NGOs. Moreover, NGOs' success in motivating local people in China will be an integral link in the "chain of biodiversity protection."

International Fund for Animal Welfare

Since 1993, the International Fund for Animal Welfare (IFAW), a U.S.-based NGO devoted to improving the welfare of wild and domestic animals, has worked in China to reduce the commercial exploitation of wildlife. Grace Ge Gabriel—the IFAW China country director—outlined IFAW's work in China by discussing three animal species that are in distress in western China.

IFAW began its China work with an investigation into the dwindling numbers of wild Asian black bears. Historically, bear bile has been used in Chinese medicine—captured bears have been held in small cages while their stomachs are pumped, harvesting the valuable bile. After persuading the Chinese government to stop issuing bear farm licenses (at the time, 7,000 bears lived on 4,000 bear farms), IFAW then built a bear sanctuary and learning center in Guangdong, which is staffed by doctors (who are paid by IFAW) and government officials. Additionally, IFAW has a continued effort to address the root of the problem, namely dispelling the belief that bear bile has legitimate medicinal benefits. Chinese medical doctors have been employed by IFAW to work on disseminating this information to the Chinese traditional medicine community and the population at large. Working with government officials, IFAW also has helped in the enforcement of CITES (Convention on International Trade in Endangered Species) regulations, distributing posters to warn travelers of restrictions placed on the trafficking bear bile.

Much like the work of Sichuan GreenRiver, IFAW has devoted much effort to rescuing the Tibetan antelope from extinction. Together with WWF, IFAW has sponsored international conferences and trade investigations on the Tibetan antelope in India, the United States, and the United Kingdom. Furthermore, IFAW has:

- Assisted the Chinese government in enforcing CITES regulations applicable to the antelope;
- Trained forestry police on CITES requirements and anti-poaching techniques;
- Lobbied the fashion industries in India and the West to ban the use of Shahtoosh; and,
- Engaged in public awareness campaigns in China and the West.

Grace Ge Gabriel reported that IFAW's Tibetan antelope campaign efforts have begun to pay off. The global market of Shahtoosh has dropped dramatically and only two cases of confiscation of poached furs were reported in 2000. More visibly, thousands of migrating antelopes were found in Xinjiang in August 2001, a number unheard of for many years.

In recent years, IFAW has begun work on habitat protection in China—focusing on identifying reasonable compromises that allow humans and wildlife to live and flourish together. One of their most successful programs has been the Asian Elephant Habitat Protection program in Yunnan Province. In partnership with provincial and local governments, the Xishuangbanna Nature Reserve, and the Endangered Species Scientific Committee, IFAW provided residents of a few small villages in the Simao region of Yunnan with environmental education and farming technical training to promote coexistence of human beings and elephants. This education was augmented by micro-credit loans to encourage locals to seek safe methods for keeping elephants away from crops. One successful strategy has been to plant specific plots of bamboo for elephants to eat. Within a year, the loan return rate on these projects has been 100 percent—more importantly, attitudes have changed. Gabriel noted that "those who used to kill the elephants are now willing to plant bamboo" for their sustenance.

Many of IFAW's smaller, local education activities on wildlife and the humane treatment of animals were made possible by partnering and coordinating with local NGOs, such as Yangxin's GreenRiver and China's first green NGO the Friends of Nature. In order to expand grassroots activities and encourage the growth of indigenous conservation groups, IFAW has offered Chinese NGOs assistance in fundraising and grant application writing. Gabriel noted IFAW's commitment to partner with grassroots organizations in China, for IFAW cannot "be everywhere and do everything." By forming extensive alliances with Chinese NGOs, IFAW not only increases its legitimacy, but more importantly helps to create a stronger foundation for effective animal protection efforts in China.

Conservation International

Focusing on a small portion of "hotspots"—the 1.5 percent of the world surface that holds sixty percent of the world's biodiversity—Conservation International (CI) has recently begun work in China. The Hengduan Mountains, which stretch from the southeast corner of Tibet through western Sichuan and extend into central and northern Yunnan, represent one of the world's 25 ecological hotspots identified by Conservation International. According to Brunner, there exists a need to balance economic growth and environmental protection in the Hengduan Mountains through (1) the expansion and better management of protected areas, (2) mitigation of the negative effects of mass tourism, and (3) the promotion of businesses that both create job opportunities and reduce pressure on the region's remaining biodiversity.

To achieve their goals of hotspot preservation, CI regularly holds conservation workshops around the world. A series of fifty worldwide workshops—over a six to nine month period—provides a great opportunity for scientists from different backgrounds and disciplines to visit, map, and integrate the biological and social data gathered on hotspots.

In order to initiate hotspot preservation work in the Hengduan Mountain region, last October CI signed a memorandum of understanding with the Sichuan provincial government, which established a principal counterpart agency within the provincial planning committee (PPC) to work with CI. Jake Brunner discussed CI's preliminary conservation priority-setting activities in the Tibetan prefecture in southwest Sichuan. CI has initially proposed that 9 to 10 percent of the area in this prefecture be protected and the Sichuan government actually has committed, on paper, to increase that level of protection to 25 percent. In order to protect this single hotspot in China, CI is focusing on four major areas of work:

- Promoting community-based or culture-based tourism or other conservation-friendly businesses;
- Reevaluating logging bans—the bans imposed in 1998 have had negative impacts on the local economy and spurred individuals to turn to wildlife poaching for income;
- Supporting and establishing local partnerships to monitor both habitats and wildlife; and,
- Engaging in continuous policy dialogue with the provincial planning committee to encourage the integration of biodiversity conservation into development planning.

While CI has been networking intensively at county, provincial, and national levels, to be effective in implementing their strategies for protecting biodiversity hotspots in China, Jake Brenner acknowledged that CI must develop a much wider alliance or network of partners. In continuing CI's work, Brenner suggested that the organization must: (1) be modest about what can be achieved given the political framework in China; (2) be aware of the complicated administrative divisions throughout the country and encourage the establishment of a new independent ministry with the exclusive mission to conserve biodiversity; (3) place great efforts into community development and awareness; and (4) engage younger generations in conservation work.

Commentary—Shanghai Greenies

By Fengshi Wu

"This is the spiritual homeland for volunteers, the hopeful homeland
for the marginalized, and the green homeland for the public spirit."
(*Welcome message on the Web site of Grassroots Community, a green NGO in Shanghai*)

On 16 April 2002, Professor Liang Congjie, founder and current president of the oldest Chinese environmental grassroots organization—Friends of Nature (FON)—took a trip from Beijing to Shanghai to meet 35 FON members and many other young environmental activists from a local volunteer organization, the Grassroots Community, which hosted the event. After Liang gave an informative talk on population, green lifestyle, and the importance of environmental awareness, the participants had a heated, yet friendly discussion, about the planned construction of golf courses around Shanghai. Ge Yumei, a journalist from the Wenhui Newspaper (a national daily newspaper headquartered in Shanghai) who attended the meeting, was intrigued with the information that these environmentalists shared on the potential environmental damage from golf courses. Ge subsequently did some research and interviews with government agencies and environmental scientists on the planned golf courses and wrote up her critique in an article for the Wenhui Information—an internal newsletter that circulates among Shanghai municipal officials, as well as her newspaper's editors and journalists. Her article pointed out the probable negative effects of large-scale golf course development in the northern Shanghai Jiangwan territories. A month after publication, the chief editor office of her newspaper gave Ge a letter of recognition from the Shanghai mayor's office and the Shanghai Planning Administration. The letter praised her article and noted that the Shanghai Planning Administration would pay attention to the specific points in her critique when they revise the golf course development plan.

Although they had been working to raise public awareness regarding the negative environmental impact from golf course development, neither Professor Liang nor the dozens of young environmental activists at the April gathering could have imagined that their discussion could have had such a direct impact on golf course development in Shanghai. Notably, Ge Yumei and a colleague had contemplated setting up a journalist salon focusing on environmental reporting and public education. The surprisingly positive response to the Jiangwan golf course critique encouraged them to move ahead with their journalist salon plans. This short anecdote highlights that even in Shanghai (which until recently had been a city bereft of environmental groups) green civil society is progressing in China.

Shanghai, the "Paris of the Orient" in the 1930s and the "leading sheep" of Deng's economic reforms in the 1990s, has a reputation for individualism and entrepreneurial spirit. Yang Dongping—a contemporary writer and co-founder of FON—pointed out in his best-selling book *Seasonal Winds of the Cities* (*Chengshi Jifeng)* that Shanghai's distinctive entrepreneurial spirit has meant policymaking and business in this coastal city is distinct from that in Beijing and Guangzhou. While Beijing is the somewhat stodgy governmental center of China, Shanghai is the dynamic financial and business hub of the country. Shanghai represents China's blueprint for development in the 21st century and the city is renowned for its vibrant job markets, investment opportunities, fast-paced lifestyle, competition, and commercialization. This economic boomtown attracts a tremendous flow of population and investment from inside and outside China. However, while the economy has thrived, civil society forces—embodied by independent social

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associations and public participation in social affairs—have barely emerged in Shanghai. Since the reform era began 20 years ago, intellectuals and social activists have been much more active in Beijing than Shanghai, particularly in the environmental sphere.

The lack of green civil society groups in Shanghai can be partially attributed to improved enforcement of environmental regulations and the effective implementation of community self-governing bodies (*shequ zizhi*). In the 1990s, the World Health Organization ranked Shanghai as one of the ten worst polluted cities in the world and the city's "mother" river Huangpu became toxic and thick with floating garbage. In response to these pollution woes, the Shanghai government began to develop stronger environmental regulations (Shanghai's most detailed and strictest urban environmental clean-up regulations were issued in April 2002). Additionally, in the mid-1990s, the Shanghai municipal government successfully decentralized more authority to community-level district governments, which gave them more autonomy. These self-reliant community-level governments in Shanghai have been very efficient in mobilizing local residents to undertake environmental protection work, creating an outlet for individuals wishing to do green activities.

Efficient community government clean-up campaigns and better environmental law enforcement have not, however, completely chilled off the sprouts of a green civil society in Shanghai. Government-led green campaigns often are limited in resources and NGOs can bring expertise to environmental problems that community groups lack. Some evidence of green civil society activity in Shanghai includes:

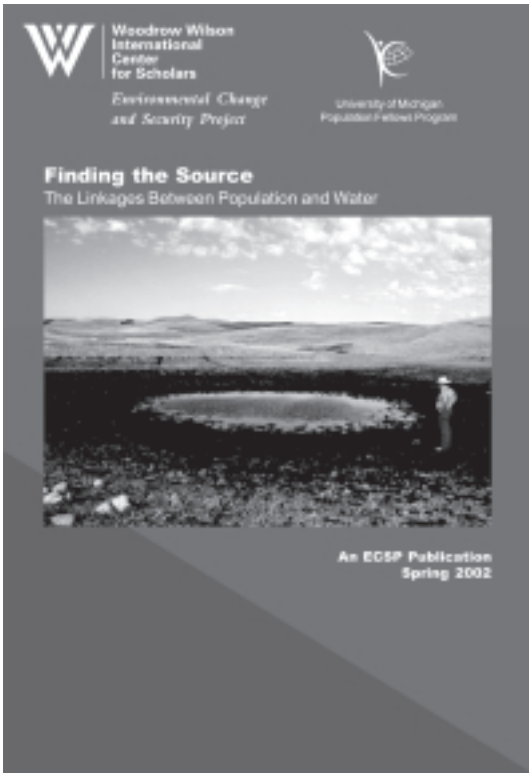
- A chat room created and supported by WWF's China Program enables more than 250 regular "chatters" to discuss serious environmental concerns in Shanghai. Some chatters also have organized themselves "off-line," taking various field trips to learn about environmental problems in their city.
- The Shanghai Wildlife Protection Station, a volunteer organization loosely affiliated with the municipal Bureau of Agriculture, has around 300 professional and expert members. The station is currently searching for grants from both public and private sectors to build an outdoor wildlife education center. In addition to promoting public awareness of endangered species indigenous to Shanghai, this volunteer organization also aims to introduce advanced methods and technologies for wildlife conservation in the city.
- Researchers at Shanghai Tongji University are cooperating with two NGOs—Beijing-based South-North Institute for Sustainable Development and U.S.-based Natural Resources Defense Council (NRDC)—and one Taiwanese research center—Taiwan Institute for Economic Research—to develop and commercialize fuel cell vehicles in China. (*Editor's Note: See NRDC inventory entry in this issue of China Environment Series*)
- While most international environmental NGOs are based in Beijing, a few have found working partners within universities, research centers, and student groups in Shanghai: (1) the Wildlife Conservation Society has been using Shanghai as its base in China since the mid-1990s; (2) some Hong Kong NGOs have supported environmental activists in Shanghai; and (3) Roots and Shoots has a Shanghai office.

While there are some nascent student green groups at Shanghai universities, currently the most dynamic and best-organized indigenous environmental NGO in Shanghai is Grassroots Community (*Re Ai Jia Yuan*). The evolution of this group illustrates the growth of civil society green circles in cosmopolitan Shanghai. In 1996 a student volunteer law association was created to provide legal advice to people, especially the disadvantaged in society. During the first four years of giving legal advice, this group strengthened its reach into local communities. In 2001, a professor from Hong Kong joined the group and suggested the volunteers utilize their skills to focus on environmental issues. This group then adopted the name Grassroots Community and in that same year it received generous financial support from various individuals, which enabled the group to build a stable staff team to support environmental initiatives. Word of this new group led environmental NGOs in Beijing to send moral support and practical advice. The advice from Beijing was timely, for Grassroots Community was in great need of information and ideas on how to mobilize and sustain environmental awareness projects and campaigns. Since September 2001, Grassroots Community has been organizing biweekly discussions for its members ranging from topics covering international environmental issues to local conservation challenges. Additionally, Grassroots Community—in cooperation with the local district government—began to organize a series of green community

development projects in May 2002. Perhaps most importantly, through meetings and Web site (www.community.org.cn) initiatives Grassroots Community is playing a crucial role in facilitating networking among Shanghai environmental activists and researchers.

The meeting with Liang Congjie and friends from Beijing green NGOs in April already has injected a new wave of enthusiasm among the Shanghai environmental activists. Ultimately, the life and strength of civil society lie in its self-reinforcing mechanisms such as networks, dissemination of information, social gathering, moral support from colleagues, and newspaper coverage. The praise from the mayor's office in Shanghai for the golf course issue raised by the NGOs is one small step to help the Chinese people to recognize, understand, and trust nongovernmental initiatives and efforts. Like the Tang verse "spring rain hydrates the earth in silence," the spread of independent voluntary spirits in China has exceeded expectations.

Finding the Source
The Linkages Between Population and Water



Population and fresh water are widely recognized as two of the most important issues facing humanity. Yet too few policymakers are aware of the close links between these two phenomena as well as their ramifications for livelihoods, economic productivity, and political and regional stability.

Finding the Source: The Linkages Between Population and Water takes an important step towards increasing knowledge about these interconnections. Its three articles highlight some of the most critical issues facing environment and development policy today. *Finding the Source* is also a step towards amplifying Southern voices in these policy discussions: by design, the author-team for each of these articles includes one Southern and one Northern writer. Each paper also features substantial treatment of developing-country cases (the Philippines, India, and sub-Saharan Africa). The common message is unmistakable: global water problems are still soluble-but only with concerted international action that includes efforts to address population growth.

Finding the Source: The Linkages Between Population and Water is available on the web at http://ecsp.si.edu/popwater.htm. For a hard copy of the publication, please e-mail ecspwwic@wwic.si.edu

U.S.-Japan Environmental Cooperation: Promoting Sustainable Development in China

20 November 2001

By Jennifer L. Turner and Richard Forrest[1]

One of the key challenges in achieving universal sustainable development will be to assist China, the world's most populous nation, onto a sustainable development path. In light of this challenge, the Woodrow Wilson Center's Environmental Change and Security Project (ECSP), Asia Program, and InterAction's U.S.-Japan Public Private Partnership (P3) Initiative hosted a seminar on 20 November 2001 entitled "U.S.-Japan Environmental Cooperation: Promoting Sustainable Development in China."[2] This one-day seminar was made possible through a generous grant from the Japan Foundation's Center for Global Partnership. (*Editor's Note: A discussion paper that provides background on U.S.-Japan-China environmental relations was prepared for this seminar and is available on the ECSP Web site (http://ecsp.si.edu) or available by contacting Jennifer L. Turner at chinaenv@erols.com*)

Takao Toda

The first keynote speaker **William K. Reilly** (Aqua International Partnership, Inc., and former Administrator, U.S. Environmental Protection Agency) stated that countries in the world should not ignore the progress China already has made in improving energy efficiency and setting up environmental protection infrastructure. If China maintains its current economic growth rate of around seven percent per year, its economy will increase fivefold by 2025—its ability to meet energy demand from domestic sources will fall short by approximately 8 percent in 2010 and 24 percent in 2040. The resulting increased demand for energy imports could result in significantly higher global energy prices. Reilly noted that the Packard Foundation (through its support of the Energy Foundation) has committed $35 million a year for work on sustainable energy projects in China, which complements the work of other foundations and nearly 40 United States-based environmental nongovernmental organizations (NGOs) currently working in China. While private foundations and NGOs can play an important role in assisting China in its sustainable development goals, Reilly and other speakers felt that the U.S. and Japanese governments could make a significant impact by providing more technical assistance, and helping to design pollution control measures, such as pollution monitoring programs and SO_2 cap and trade systems policies.

Masahiko Kiya (The First Secretary of the Economic Section at the Embassy of Japan), providing the second keynote address, stressed that Japan and U.S. cooperation on global issues is very important and supporting China onto a sustainable development path is a common interest for both Japan and the United States. During the Clinton administration Japan and the United States cooperated on global issues under the framework of the Japan-U.S. Common Agenda for Cooperation in Global Perspective. This forum facilitated dialogue and cooperation on environmental issues, especially climate change. First Secretary Kiya stated that the new Bush administration and the Japanese government currently are examining past bilateral initiatives in an effort to create a new cooperative framework at the next bilateral summit. A new framework for cooperation could include two promising elements: (1) coordinating strategies for tackling global challenges such as the environment; and (2) stimulating greater involvement of civil society groups to build a stronger and more effective cooperative partnership between the United States and Japan.

Reflections on U.S. and Japanese Environmental Assistance in China (Panel 1)

Kurt Tong (U.S. Embassy in Beijing) presented the U.S. government's three primary goals in environmental assistance: (1) to help China develop the technical means to prevent environmental degradation; (2) to share U.S. experience in environmental policy and regulation development; and (3) to support China's growing trend of public participation in environmental governance. In support of these goals, sixteen U.S. agencies were undertaking nearly 80 environmental and energy projects in China in 2000 and some agencies, such as the Department of Energy (DoE) were supporting NGO and national laboratory work in China.

Technical assistance is the focal area of bilateral cooperation, and the United States is a leading donor for China's environmental protection—more in terms of expertise than financing. A number of technical agencies, such as DoE, Department of Interior, and the Environmental Protection Agency have been involved in environmental and energy-efficiency technical assistance in China for many years. While there are numerous high-quality domestic and international programs to train Chinese environmental technicians, the development of expertise in environmental public policymaking has been conspicuously lacking.

Turning to U.S.-Japan cooperation in China's environmental protection, Tong identified comparative advantages of each government's current efforts. Both U.S. and Japanese environmental programs in China are characterized by strong technical capacities and a commitment to environmental infrastructure building. However, the U.S. government initiatives tend to emphasize public policy development and implementation, while the Japanese government focuses more on human resources development. The Japanese program also features a much stronger financial element, while the U.S. government is more hamstrung in providing direct financial assistance to entities within China in any policy sphere.

Looking forward to the prospect of U.S.-Japan cooperation in promoting environmental causes in China, Mr. Tong stressed the importance of sustained information sharing and strategic coordination between the two sides over sporadic joint project formation. On the information side, both could draw upon each other's unique experience and contacts established through decades of fieldwork in China. On the strategic coordination side, Tong proposed concentration of limited resources into sectoral and regional priorities. This collaboration could be a sectoral focus such as clean and efficient energy, in which both the United States and Japan have a lot to offer in terms of public and private capacities; or a region-oriented approach to engage both countries' expertise in developing environmental strategies for a region in China.

Japan is the largest provider of environmental official development assistance (ODA) in the world. **Takashi Nakamura** (Japan Bank of International Cooperation—JBIC) commented that JBIC's environmental portfolio in China has increased as growing pollution problems threaten human and ecological health in China and Japan. The amount of environment-related yen loans Japan has made to China increased nearly 50 times between FY1995 (¥2,552 million) and FY1999 (¥124,989 million). In FY1999, around 65 percent of all yen loans to China included environmental objectives.

Japan's vulnerability to pollution from China explains the high level of Japanese public and private interest in promoting environmental protection in China. JBIC is the flagship Japanese agency in leading environmental lending and projects in China. JBIC is the world's second largest multilateral development agency (second only to the World Bank) and China is JBIC's second largest client, next to Indonesia.

The JBIC environmental portfolio in China features urban environmental improvement (the 'brown' agenda) and nature conservation (the 'green' agenda). Pressing urbanization problems in China involve many sectors from water and gas supply, to sewerage and solid waste treatment. JBIC therefore has initiated over 70 urban environmental projects in some of the world's most polluted cities in China. These projects range from introducing clean energy production technology and facilities to ensuring efficient monitoring and implementation of the facilities. Commenting on the challenges for future urban projects, Takashi noted that a broader economic rather than pure technical solution might be in order, since a major contributor to urban pollution is the state-owned industrial sector which is undergoing a painful restructuring process. In the area of nature conservation, JBIC is actively engaged in afforestation and grassland redevelopment efforts in China, mostly in the western province of Shaanxi.

While Japan provides significant environmental assistance to China, particularly through the Green Aid Plan (GAP), **Peter Evans** (Massachusetts Institute of Technology, MIT) stated that one of the shortcomings of Japan's GAP is that it has not led to significant diffusion of Japanese clean technology. The fact the commercial market for environmental goods and services in China is weak has meant that the GAP assistance has led to few

orders for Japanese firms.

Peter Evans draws his observations on Japan's aid from five years of work on a large MIT-Tsinghua-Tokyo University project that examined Japan's Green Aid Program (GAP) and other international efforts to introduce cleaner and more efficient-energy technologies into China.

Within China, there is a huge demand for subsidized financing to help develop environmental goods and services to clean up China's industries and environment, but a weak demand for such goods and services sold on commercial terms. In lieu of a market, various foreign governments are providing a considerable amounts of aid into this sector, but, as noted above, face the challenge of translating this aid into later export sales.

Peter Evans examined 253 environmental aid projects from around the world into China between 1993 and 1998. Not surprisingly, Japan's ODA dominated and totaled nearly 1 billion dollars at a subsidy level in development assistance terms of 70 percent—which means it was cheap money with officially 9 percent untied. Japan's GAP is also large—300 million dollars over the same five years, but it was 100 percent tied and 100 percent subsidies, so it consisted of grants to China. In his research, the United States devoted only 4.9 million dollars toward China-environment work during that time period. Unlike Japan, this money is not considered ODA, for it was spent on U.S. organizations doing work in China and not given directly to Chinese agencies.

While GAP projects have created useful demonstration projects and provided some technology with a grant, it has been difficult to get the Chinese to buy the second unit at the commercial rate. Another problem is that these projects focus on end users, such as helping a power plant buy a technology, but the assistance does not train manufacturers who would like to produce this technology. Therefore the GAP is not really a technology transfer program. There also have been many disputes within the GAP over intellectual property.

Peter Evans than briefly expanded his discussion to address how a binding agreement in the OECD is shaping the terms and conditions of aid and assistance—both commercial and non-commercial. The OECD's 1992 agreement on export credit arrangements (the Helsinki arrangement) established a commercial viability test for tied aid, which has had a significant influence on aid programs to China. The current OECD negotiations are about reaching common environmental standards on commercial export credit financing globally, which will have an impact on China, which is one of the biggest buyers of environmental technology using export credit.

Japan created a special environmental ODA program, which represents Japan's concern about the environment and desire to take a leadership role. Evans notes, however, that this program came about after the Helsinki agreement was set in place and Japan might have set up this special environmental ODA to escape the Helsinki rules, because the terms of this aid became over 80 percent concessionality, which freed Japan to tie this aid in China.

In 1993, some environmental NGOs in the United States were successful in putting higher environmental standards on the U.S. Export-Import Bank relative to other export credit agencies (ECAs) in the world. Because the U.S. Exim Bank had environmental standards higher than China, it became impossible for the United States to provide financing to U.S. exporters interested in the lucrative Three Gorges Dam project. However, ECAs in Japan, Germany, and Brazil did finance the dam, which inspired some international NGOs to begin a campaign to put environmental standards on all export credit financing agencies. Evans noted that if OECD passes strict environmental guidelines for ECAs this will create a common level playing field and potentially make cooperation between countries (such as the United States and Japan) wishing to promote environmental technologies in China (and other developing countries) much easier.

In his talk questioning whether Japan's environmental technical cooperation with China is but "a drop in the ocean," **Takao Toda** (Japan International Cooperation Agency) described how the aid and projects that Japan directs at China emphasize the development of human resources—especially training environmental specialists—and technology. The long-term commitment of Japan's environmental technical cooperation with China is symbolized in the Japan-China Friendship Environmental Protection Center, which was built in 1992 to promote the transfer of basic environmental technology. When the friendship center was built, mistrust colored Sino-Japan joint cooperative programs. Toda noted that in the environmental realm, the friendship center has demonstrated Japan's commitment to working in China, which has immeasurably improved cooperative initiatives.

During the first five years of the center, the Japanese focused on environmental capacity building to transfer basic technology. Over the most recent five years the emphasis has been on disseminating the technologies transferred to China's local governments. Some policy work has begun on water and air pollution, but Toda notes that the United States is much further in this area with China. Some concrete outputs from the friendship center include Sino-Japan cooperation setting up air

pollution monitoring systems in 46 cities, work on improving China's environmental management systems, and water quality monitoring in key lakes.

In looking to the future, projects at the friendship center will address green issues—especially in China's western regions—and tackle the problem of acid rain in a more holistic way. Moreover, Toda noted that they aim to enlarge the city air quality network from 46 to 100, as well as cooperate with the World Bank's 30-city air quality network.

Toda shared a chart that mapped the trends of various Japanese organizations active in environmental work in China. While still the largest player, Japan's central government role has been slightly decreasing in recent years, but the activities of universities, the private sector and local governments grew steadily in the 1990s.

The initiatives and dynamism of Japanese local governments working in China to help promote environmental management in Chinese cities is one distinctive component of Japan's approach to environmental cooperation in China. These municipal and prefecture governments notably are working outside of Japanese central government China projects. For example, in Shanghai, the Osaka municipality is doing considerable air quality work, while in Sichuan, Hiroshima prefecture and other Japanese cities are undertaking energy-saving projects.

Regarding the activities of Japanese NGOs, Mr. Takao Toda mentioned that Japan is increasing assistance to NGOs, although he sees large-scale foreign aid activities crowding out the activities of NGOs. Mr. Nakamura of JBIC added that JBIC is preparing to finance NGO afforestation activities; their research has already revealed some 60 Japanese NGOs or private citizen initiatives undertaking anti-desertification and tree planting activities in China.

As commentator for Panel 1, **Miranda Schreurs** (University of Maryland, Department of Government) was struck that while the presentations focused on the diversity of important technical projects, no one dealt with how the debate surrounding the Kyoto Protocol may have implications for China. The United States is clearly walking down a different path from Japan (and the European Union, EU) on how to deal with such global environmental issues. Japan and the EU tend to focus on the short-term pollution control measures (e.g., end-of-the-pipe solutions) needed to improve climate change problems. Conversely, the United States is focusing on how to move beyond short-term fixes to the climate change problems and push society to the next set of technologies. For example, foreign assistance can put scrubbers on plants in China, but as China's economy grows, more dirty factories will be built. It is difficult to create incentives for industries to develop technologies that do not yet exist.

The verdict on Kyoto will impact how each country deals with China. For example, as the rest of the world moves forward on Kyoto, opportunities will open up for EU and Japan to work with China on the Clean Development Mechanism to get offset credits for their own domestic climate change emissions. Dr. Schreurs pondered where U.S. industry fits into this picture if the U.S. government does not move forward on Kyoto.

Dr. Schreurs noted that the United States has been much more involved in promoting NGO participating in China than has Japan. She noted that the United States has a political, as well as an environmental goal, to help change China's political culture through slowly increasing civil society involvement in decision-making. Japan does not like touching such sensitive political issues and therefore Japan's environmental programs do not (yet) push NGO involvement.

Work at the Local Level Promoting Sustainable Clean Energy Projects (Panel 2)

In the seminar's second panel, speakers introduced their energy projects with Chinese NGOs and local-level institutions and communities as another means of promoting successful environmental assistance in China.

United Nations Foundation (UNF)

In her description of UNF's Climate Program in China, **Wang Xiaodong** (Program Officer for Climate Change) highlighted their innovative work in designing financing mechanisms for renewable energy projects at the local level in China. Similar to the NGO representatives at the meeting, she identified that the key to the program's success has been building a broad range of partnerships among local government agencies, research centers, and community groups.

Ms. Wang outlined a variety of barriers that have prevented the large-scale deployment of renewable energy technologies in China and other developing countries: (1) institutional barriers, such as the lack of sustainable human infrastructure to translate the potential for renewable energy into commercially viable project activities; (2) the lack of financing and prohibitively high up-front costs; and (3) the lack of a supportive regulatory framework. UNF has worked to surmount these barriers in China, Brazil, and India by providing "enterprise development support," which includes partnerships with banks (both local and multinational) and advisory services

to promote community-level-funded model renewable energy utilization systems. As an example, Ms. Wang cited the CREED project in Yunnan Province, in which UNF provided micro-finance—an equity loan guarantee (not the traditional grants normally provided by foundations)—as well as capacity building services to local entrepreneurs. The UNF would like to work with NGOs on their project in Yunnan Province, but Ms. Wang indicated that it has been hard to find Chinese NGOs on-the-ground in Yunnan that focus on energy issues. Therefore, UNF funded the U.S.-based organization The Nature Conservancy to assist in the work.

William Reilly

Natural Resources Defense Council (NRDC)

Barbara Finamore provided the Natural Resources Defense Council's (NRDC) China Clean Energy Program as an illustration of how innovative partnerships among nongovernmental environmental organizations are providing another model of successful environmental assistance to China. NRDC is interested in promoting energy efficiency, renewable energy technologies, and tighter emissions standards in China's building, utility, and transportation sectors. One major NRDC project has created a tripartite partnership of American, mainland Chinese, and Taiwanese institutions to promote the diffusion of fuel cell-powered vehicles, especially motor scooters, in China. Taiwan was chosen as a partner in this initiative because its government has promoted the goal that two percent of all motor scooters must be electric-powered. Moreover, Taiwan has set up a public-private fuel cell partnership that was modeled on the experience of California and augmented by a memorandum of understanding with the California environmental protection agency to cooperate on issues related to low-emission vehicles.

NRDC worked with NGOs in Taiwan, (e.g., the Taiwan Institute for Economic Research) and China (e.g., the South-North Institute for Sustainable Development), as well as brought together businesses and the municipal governments of Taipei (where mayor had campaigned on an environmental platform) and Shanghai (a city with a progressive environmental policy agenda). Shanghai was chosen as the project location because it has become a national center for investment in research and development of fuel cell vehicles in China. Additionally, the Taipei-Shanghai "brother city" relationship that this initiative spurred helps elevate the environment on the political agendas. Ms Finamore noted that NRDC's local NGO partners were key in making contacts with the government officials and facilitating the diverse fuel cell scooter initiative.[3] She added that bringing together cross-strait groups resembled a kind of "track-two" diplomacy effort.

One of the main lessons learned from NRDC's experiences in the fuel cell project is that human linkages are crucial. Beyond promoting fuel cell research, the project's value also lies in the process of bringing together a group of Taiwanese and mainland Chinese from the government, business, scientific and NGO sectors. Such local-level, small-scale environmental cooperation clearly can provide a framework for tearing down barriers between sectors and regions. While environmental NGOs in Mainland China are few in number and somewhat limited by the government, these NGOs also have the advantages of avoiding the "political baggage" of other higher-level state organizations that could never have individually initiated a cross-straits environmental initiative. While promoting local-level diverse environmental cooperation in China can produce impressive results, such initiatives require patience, a long-term view, and flexibility.

Beijing Environment and Development Institute (BEDI)

Ma Zhong (director, Beijing Environment and Development Institute, BEDI) outlined how his NGO is working with the U.S.-based Environmental Defense (ED) to assist two medium-sized Chinese cities to create SO_2 emissions trading programs. Since 1997, BEDI and ED have cooperated on local-level SO_2 research and pilot projects and in creating the SO_2 emissions trading programs they have discovered that environmental pricing issues are key. To address this pricing challenge their strategy has been to address total emissions control, as well as supporting the introduction of pollution levies. Their projects have experienced setbacks within each city, caused by the lack of implementation tools for these market-based environmental protection approaches and the existence of conflicting policies and regulations. Their projects are ostensibly trying to change each city's

approach to pollution problems from a local, short-term strategy to a transboundary and long-term sustainable strategy.

Dr. Ma acknowledged that their emissions trading projects are improving, due in great part to the rising commitment to the environment within each city's government. Similar to Barbara Finamore's experiences, Ma Zhong felt that the key to the BEDI-ED success has been to patiently "learn by doing" together with Chinese collaborators and to prioritize building of diverse partnerships.

Panel 2 discussant **Elizabeth Economy**, Senior Fellow for China for the Council on Foreign Relations, noted that there has been a "sea change" in China in the 1990s that opened up opportunities for international environmental efforts. The changes are characterized by three trends:

- The growing role of the market and integration of China into the global economy;
- The growing role of international environmental NGOs that lack political baggage and can therefore bring creative solutions and the ability to build networks within China; and,
- An emphasis among Chinese officials on practical approaches to solving problems.

Dr. Economy feels that future needs for environmental cooperation with China should include focusing on policy design, including strengthening currently weak incentives and, especially, enforcement structures. The labor-intensive and difficult process of replicating successful environmental and energy-efficiency demonstration projects should also be addressed by Japanese and U.S. organizations and agencies working in China. Building the human infrastructure is therefore essential.

Conclusion

U.S.-Japan exchange of information on lessons learned in China or undertaking some joint efforts to assist China in these energy-efficiency, pollution, or conservation areas could contribute not only to the solution of some environmental problems, but also could help to build trust and cooperation among the three nations. Moreover, this type of "green cooperation" between Japan and the United States could also become a model for U.S.-Japan cooperation to assist the sustainable development of various nations and regions across the globe. In addition to proposals made during the presentations, discussions after each panel raised some suggestions on how the United States and Japan could build environmental cooperation to promote sustainable development in China:

- Coordinate or exchange information on current U.S. and Japanese initiatives to disseminate clean technologies and promote energy efficiency in China;
- Build information exchange opportunities between U.S. and Japanese organizations and agencies that are addressing challenging conservation work in Western China (e.g., JICA is supporting some research in Xinjiang for biomass energy sources and The Nature Conservancy is undertaking a major conservation project in Yunnan Province);
- Create a trilateral sister-city program, in which one U.S. and one Japanese city could promote environmental infrastructure development in a Chinese city;
- Establish joint NGO activities to create more networks for diverse organizations in the state and non-state sectors in China to meet, exchange views, and cooperate;
- Create a network (using face-to-face meetings and internet technology) linking American, Japanese and Chinese environmental experts to share information and lessons learned on projects in China;
- Initiate American and Japanese support for programs that will improve the infrastructure to monitor environmental concerns and promote the capacity building of local governments, citizens and NGOs, legal reforms, and training of lawyers, scientists and other specialists.

Endnotes

[1] We would like to thank Liang Sun and Fengshi Wu for assistance in this summary.

[2] The Wilson Center and InterAction held another meeting on this topic in Tokyo in March 2002. See this issue of the *China Environment Series* for the meeting summary

[3] In Taiwan where the long-ruling Nationalist Party must share power with the Democratic People's Party, one challenge NRDC faced was avoiding giving advantage to one political party over the other

(R)evolution of Rural China

11 December 2001

Zhou Qiren, Beijing University

Marilyn Beach, National Committee on U.S.-China Relations

Baoqing Zhao, Chinese Embassy in Washington, DC

By Liang Sun and Jennifer L. Turner

Joining the World Trade Organization (WTO) is both a continuation and a breakthrough in China's decades-long process of reforming and integrating its economy into the global market. An examination of the challenges facing China's rural sector as the country enters WTO highlights the complex interactions between global economic integration and domestic policy dynamics. The three speakers on this panel stressed that while China's accession into WTO offers some benefits for rural residents and agricultural production, stable and sustained rural prosperity will depend much more on the ability of the Chinese government to complete land, labor, and financial market reforms while adequately enforcing natural resource protection laws.

Growth, Change, and Poverty in Rural China

For over 50 years China's agricultural sector has been heavily taxed to finance the country's intensive industrialization program. Decollectivization of agricultural production and the return of family farms in the 1980s heralded China's broader national reform program and created opportunities for greater rural prosperity. These rural reforms stimulated both growth and diversification of crop production besides releasing many from agricultural labor. By 1997, however, growth rates for both rural income and productivity had stagnated. Since the 1980s, roughly 150 million agricultural workers have left farming, several million of which have migrated to the lower tiers of the urban services sector. Despite the reforms and mass migration to the cities, rural areas, home to 70 percent of the Chinese population, capture only 30 percent of the country's GDP. Income for farmers rose barely 1.8 percent in 2000, the lowest increase since the beginning of reforms 22 years ago. It is perhaps not surprising that the major root of discontent in rural areas is unrelieved poverty. In fact, in its 2000 year-end review of domestic affairs, the Communist Party leadership singled out rural unrest as the biggest threat to its rule. In internal talks, President Jiang Zemin gave top priority to three overriding tasks in the countryside: boosting agricultural production, increasing farmers' incomes, and maintaining stability in villages.

The Need for Stable Land Tenure

In light of the rapid expansion of the industrial and service sectors, the trend of a declining share of agricultural value-added in the national economy is likely to continue in the coming decades. It is therefore crucial for the Chinese leadership to create new sources of income for China's rural population. Besides moving more rural laborers out of agriculture into industrial and service sectors, the government needs to create a new land use system that will enable rural residents to share the benefits of rapid industrialization. Currently rural residents rent the land from the state and easily lose user rights when local governments opt to lease farmland to industrial or urban development companies.

The Potential Shift to High Value, Labor Intensive Crops

Since abundant labor supply remains an important comparative advantage for China's rural sector, under WTO farmers could enjoy income gains through the development of labor-intensive, value-added farming activities (e.g., vegetables, horticulture, and organic farming). However, such a transformation in agricultural production patterns must be supported by the creation of a sound market-based distribution system. Specifically, four types of market mechanisms are necessary to help farmers break into new niche markets:

1) An open and competitive agricultural product market;
2) An integrated labor market;
3) A mature land market with clearly defined property

rights; and,
4) A competitive financial market for more efficient resource allocation.

The WTO and Rural Change

It is in this context of half-completed rural economic reform that China now enters WTO. The main components of WTO agreements that will affect China's agricultural sector include:

1) Elimination of sanitary and phytosanitary barriers on U.S. exports of wheat, citrus, and meat;
2) Elimination of China's subsides to agricultural exports;
3) Adoption of a tariff-rate quota (TRQ) system for grain imports;
4) Reduction of tariffs on agricultural products to well below 20 percent for major agricultural imports from the United States; and,
5) Liberalization of state monopoly and allowing private companies to engage in agricultural trade.

The impact of WTO on agricultural production and the lives of rural residents initially will not be as great as the immediate changes the agreement will have on the industrial sector. Previous agricultural reforms already have cut subsidies to agriculture, so China's WTO commitment to decrease agricultural subsidies will have little impact. Increased grain imports are expected to enable many of China's farmers to shift from low-profit crops, such as wheat, corn, rice, and cotton, to the more lucrative and less state-controlled fruit, vegetable, and meat markets. For example, WTO's tariff-cutting measures are expected to boost China's vegetable export market by as much as five percent a year. Certainly, rural workers will benefit if they find employment opportunities in these new niche markets or in agricultural production sectors that thrive as a result of WTO's lower restrictions for China's export goods.

WTO and Rural Reforms in China

Marilyn Beach from the National Committee on U.S.-China Relations stressed that while allowing farmers to change from food-security crops to higher value crops may raise rural incomes, the economic impact of such shifts would vary widely throughout the country. In less prosperous areas—such as wheat, maize, and soybean growing regions, as well as forest and timber producing areas—the effects of WTO on the rural quality of life will depend on how successful poverty alleviation efforts are in the countryside. The fear in some rural areas is that WTO will only attract funds to already wealthy areas, leaving poor, interior regions to lag further behind.

Many of the rural structural reforms needed in China are not directly tackled in the WTO framework. In fact, many of the potential gains of WTO membership in the agricultural sector—particularly the long overdue liberalization of the state monopoly of grain production and permission for private companies to engage in agricultural trade—can be fully realized only when new rules of fair and open competition are combined with sustainable investments in agricultural technology, market expansion, and education. China's farmers also need access to a greater share of the benefits of rising land values.

The rural people who may be displaced by WTO will need access to information and training on how markets work. The Chinese government therefore needs to put a premium on investments in education and technical training on how domestic and international markets function and how to promote post-harvesting technologies such as food processing, packaging, and transportation. While setting up and funding such training programs for rural farmers would be challenging, such capacity-building activities (as well as agricultural environmental investments) are exempt from WTO restrictions on subsidies. Zhou Qiren from Beijing University noted that a potential solution to the dilemma of abundant labor supply and low productivity would be for the government and business communities in China to create a contract-based system that links modern, economy-of-scale agricultural businesses with the labor-intensive farmer households.

Impact of the Sanitary and Phytosanitary Agreement

In his presentation, Zhao Baoqing from the Chinese Embassy in Washington, DC highlighted the Sanitary and Phytosanitary (SPS) Agreement's (part of China's WTO accession packet) important effects on the adequacy of animal, plant, and human health standards in China's agricultural sector. The SPS agreement restricts China from potentially trade-distorting inspection and border control measures and imposes higher transparency criteria. These requirements pose challenges to the country's limited technical and administrative capacities to protect China's farmlands and pastures from alien (including genetically-modified) products and species while complying with international SPS norms. Moreover, Chinese farmers, especially those in less developed inland areas, are not equipped with adequate knowledge or technical support to identify and combat these risks. Notably, these gaps in capacity are addressed in the 1999 U.S.-China Agricultural Agreement. This bilateral

agreement provides the framework for bilateral cooperation for training and information sharing on environmental protection issues in the agricultural sector—ranging from measures to improve pest and disease management to sustainable irrigation and land use.

Local Governments Lack Resources for Rural Reform

While Beijing is committed to fulfilling WTO requirements, domestic policy dynamics potentially hinder rural areas from taking advantage of WTO-related adjustments. Specifically, over the past twenty years the central government has decentralized considerable administrative and economic powers to the provincial and sub-provincial governments. While they possess greater authority, local governments often lack sufficient resources (and incentives) to carry out the necessary structural reforms and policies that could help the agricultural sector. In short, local governments in China face daunting challenges in improving the livelihood of rural inhabitants, 15 percent of which are unemployed and underemployed. Prior to the reform era, rural and urban inhabitants had little freedom of movement due to a household registration system that tied them to their workplaces. Throughout the 1980s and 1990s rural citizens have been moving to urban areas without being granted the legal right to live in cities. This meant they faced difficulties in acquiring housing and access to other urban social services. The current proposed household registration system reform to loosen registration requirements in cities might accelerate the already significant trend of rural unemployed migrating to cities and further straining urban infrastructure.

Ultimately, difficult policy reforms in rural areas will be key to ensuring a smooth transition for farmers adjusting to more open markets and moving successfully to new crops. For instance, the government has made tentative legislative moves to redefine rural property rights to encourage more efficient and sustainable land use and conservation. Economic welfare of the farmers can only be achieved when the farmers themselves have a bigger say in the allocation and use of rural resources in such forms as farmers associations. However, the increased fiscal burden on local governments, particularly in poor inland regions, hinder their ability to institute the needed agricultural reforms, especially investments in infrastructure, sustainable production, and conservation.

WTO has outgrown the simple formula of numerical free trade. In November 2001, at the same WTO ministerial meeting where China was formally accepted as a member, WTO put new emphases on the environment and development programs in the organization's agenda. While it is difficult to predict how tariff reductions in primary commodities such as timber and minerals will affect China's rural sector, it is clear that domestic policy choices in the changing international environment may more directly and more profoundly impact the livelihood of China's rural population in the coming decades than the fulfilling of WTO agricultural agreements.

Difficult policy reforms in rural areas will be key to ensuring a smooth transition for farmers adjusting to more open markets and moving successfully to new crops

This panel was part of a larger conference—China Joins the WTO Domestic Challenges and International Pressures—held at the Wilson Center. The Environmental Change and Security Project, The Asia Program and Project on America and the Global Environment cosponsored this conference. For information on the full conference summary contact Jennifer L. Turner at chinaenv@erols.com or 202-691-4233.

The Challenge of Reforming and Environmental Legal Culture: Assessing the Status Quo and Looking at Post-WTO Challenges for the People's Republic of China

By Richard J. Ferris Jr. and Hongjun Zhang
(Georgetown International Environmental Law Review (14), 430, Spring 2002)

China continues to make strides toward a "rule of law" approach to environmental regulation. Nevertheless, progress in formulation and enforcement of China's environmental laws remains somewhat erratic and slow. Membership in the World Trade Organization (WTO), however, should prompt more rapid progress in the sphere of environmental lawmaking. To provide a foundation for assessing the rapid legal and cultural changes that China faces as a new member of WTO, this article provides an overview of China's environmental challenges and an outline of key WTO obligations placed on China as a member. Additionally, the article—drawing on extensive interviews with Chinese officials—reviews current developments in China toward certain WTO-consistent changes in its legal regime, focusing on changes in the environmental law system by exploring:

- Background information on important WTO requirements that will affect China's legal system, particularly key aspects of China's regulatory system;
- WTO requirements that may spark the development of clear and effective notice of environmental laws and greater public participation in the lawmaking process in China; and,
- How WTO measures may strengthen the formulation and enforcement of China's environmental, health, and safety standards.

The authors argue in the conclusion that in order to increase the personal and political capacity in China to accept and accommodate China's WTO commitments and translate these commitments into workable legal reforms, intensive training will be needed for national, provincial, and local lawmakers. Specifically, these lawmakers would benefit considerably from training to improve their legislative skills and enhance their knowledge of both environmental issues and WTO requirements.

Powering Up the Dragon: World Bank and NGO Energy Efficiency Projects in China

1 February 2002

Denise Knight, International Institute for Energy Conservation

Robert P. Taylor, World Bank

Pam Baldinger, Baldinger and Associates (discussant)

By Timothy Hildebrandt and Jennifer L. Turner

Since the 1997 financial crisis, many Asian countries have struggled with stalled economies, however China—perhaps proving itself as a resilient dragon—has seen only a modest drop in its economic growth. China's economic dynamism is well known, but another little heralded aspect of China's growth has been the significant drop of energy consumption as the economy has expanded. The quadrupling of China's GDP from 1980 to 1995 resulted in only a doubling of energy demand. Despite this drop in energy intensity, China's economy still could benefit from energy efficiency improvements in the industrial and housing sectors. The past progress and the current commitment of the Chinese leadership to increase energy efficiency have motivated international organizations—governmental, bilateral, and nongovernmental alike—to offer their assistance to promote energy efficiency in China. This Wilson Center meeting highlighted the progress and challenges the World Bank and the International Institute for Energy Conservation have faced in implementing energy efficiency projects in China.

The World Bank and Energy Service Companies

In the 1990s, the World Bank began undertaking studies in China to explore opportunities for stimulating investment in energy efficient technologies. These studies emphasized the potential for cost effective retrofit projects—namely, small-scale projects adding a single piece of energy efficienct equipment to industries or improving management skills, rather than investing in projects to restructure a whole industry. Even though such small projects would generate fast and significant rates of return, such projects were not being undertaken in China. Through interviews Robert P. Taylor learned that Chinese factory managers either were unfamiliar with energy efficiency technologies or they did not believe that installing such technologies could generate a big rate of return. Investing in energy efficiency technology generates an estimated savings for factories (e.g., reduces operating costs by .1 percent), which is not as tangible an activity as taking out a loan to expand a factory or develop a new product line.

Not only do Chinese factory managers view installing such equipment as a low priority, but domestic banks also do not perceive these projects as attractive. Such small projects create high transaction costs, generate low returns, and utilize complex technology; so Chinese banks have difficulty in appraising the value of energy efficiency investment projects. At the more macro level, however, small investments into energy efficiency technologies could add up to large energy savings for Chinese industries and significant environmental benefits nationwide. Moreover, argued Taylor, a considerable amount of money could be made if these small investment projects could be packaged together.

In 1995, the World Bank spoke to officials in the Chinese State Economic Trade Committee (SETC), who were interested in moving China from a planned energy efficiency system to a free market structure. As an alternative to the usual World Bank energy efficiency loans to a large number of enterprises, Taylor suggested developing energy service companies (ESCOs) to perform energy performance contracting. ESCOs specialize in performing detailed energy audits of the client's buildings or factories. These audits lead them to propose designs for new energy systems, as well as suggest improvements to operating practices that will improve energy efficiency. In addition to acting as a consultant, ESCOs also can provide investment for energy efficiency projects within their client's company. By developing and financing projects the ESCOs take on high levels of risk with the hope of earning high returns on their investment. While ESCOs are common in industrialized countries, few developing countries use such companies and until 1995 ESCOs were an unknown in China.

In order to help China develop stronger institutions

to facilitate financing and encourage the adoption of energy efficient technologies in Chinese industries, SETC officials were willing to join the World Bank in an experiment to create ESCOs (dubbed energy management companies—EMCs—in China). Together with the Chinese government, the World Bank organized three joint stock companies (located in Liaoning and Shandong Provinces and Beijing). The first phase of the project consisted of the shareholders putting up equity of 30-50 million RMB and the provision of significant World Bank technical assistance to: (1) teach these companies how ESCOs worked in the United States and Europe; (2) help the Chinese ESCOs develop pilot projects; and (3) assist the ESCOs in creating contracts that suit the Chinese market and legal system.

After the technical assistance phase, these three ESCOs were given Global Environment Facility (GEF) support of $15 million and a World Bank loan of $60 million (with an additional $20 million line of credit) in 1998. These funds enabled each company to establish more pilot projects and increase their equity position. Through 1999-2000 the three ESCOs (1) acted as consultants and investors for approximately 50 projects; (2) developed more energy efficiency product lines to offer clients; and (3) hired more staff. By late 2000 each company began to earn some profits, which was significant since the World Bank loans had a high interest rate and carried a heavy foreign exchange risk. The companies are growing and next year plan to invest $26 million in another 80 projects.

Building on the ESCOs success, the World Bank is in the process of initiating the China Energy Conservation Phase II Project that will seek to build an ESCO/EMC energy efficiency industry. This second project aims to engage the Chinese financing community as the key financier for ESCOs/EMCs. This project is developing an EMC service group to train new companies and to provide policy advocacy services to the EMCs. The World Bank also is providing training programs to help Chinese managers set up ESCO/EMC businesses. In addition the project will create a guarantee fund, since the financial sector in China is half reformed and very risk adverse. The guarantee fund can provide partial credit for loans to the EMCs, which would lower banks' perception of risk.

International Institute for Energy Conservation's Efficient Motors Program

While the World Bank focused primarily on strengthening the financing opportunities for industries to install more energy efficient technologies, the International Institute for Energy Conservation (IIEC) (a nongovernmental organization that aims to promote sustainable energy in industrializing and transition economies) sought to focus on one industry and to facilitate policy development and cooperation among stakeholders that would help to develop a market for an energy efficient product. Led by Asia Director Denise Knight, IIEC developed a systematic plan of action to promote market transition in China:

1. IIEC undertook a comprehensive market assessment of three high-energy using technologies in China—motors, transformers, and ballasts. The market assessment examined the existing institutions and legislation supporting energy efficiency development, current technological capabilities in China, and available financing for these three energy efficient technologies;
2. After choosing a specific technology (motors), IIEC developed strategies to overcome current market and policy barriers;
3. With this information, IIEC then sought to build collaboration with all interested parties in the government and business sectors; and,
4. IIEC and its partners began implementing specific policies (standards and labeling), market training programs, and financial development measures to help promote the growth of the market for the chosen technology.

IIEC and its partners all agreed that motors were a cost effective technology, offering terrific savings potential and an untapped market for investments. This market was ideal for development in China, because prior to the IIEC program only 15 percent of Chinese motor manufacturers were producing products that actually met U.S. efficiency standards. These plants, however, focused on export products.

IIEC together with the government and business stakeholders confirmed that the key obstacle to energy efficient motor markets in China was that there was no way for motor manufacturers to differentiate their motors as efficient, for there existed no government policy or standards for energy efficient motors. Financing for such investment was also short. Therefore, IIEC needed the motors program to help prove that the savings in installing efficient motors would create real savings and that the motors would perform as expected. Chinese research institutes helped create the standards that were integral to the design of national energy efficient motors certification programs and efficiency standards. IIEC also

initiated a demonstration of a very successful energy efficiency motors project with Shengli Oil—the second largest oil company in China.

Uncovering Obstacles

One notable similarity in the World Bank and IIEC approaches to energy efficiency work in China was that both began their work by exploring why the energy efficiency markets remained untapped. Understanding the fundamental challenges to market development was integral to mapping out an effective strategy for their energy efficiency programs. Both Taylor and Knight discovered similar barriers to energy efficiency markets in China:

- *Insufficient knowledge of energy efficiency and its benefits.* Taylor noted that industry leaders often were unaware of projects already in existence that could result in significant savings and a possible rise of profits. Knight noted that the lack of clear standards for energy efficient products and widespread misunderstanding over what defines energy efficiency meant that many end users in China thought they already were purchasing energy efficient products.
- *Perception of high risk.* With so many opportunities for secure investments in China, there is great reluctance to invest in energy efficiency improvements, which do not produce immediate large cost savings to the producers and consumers. The lack of incentives to enter the energy efficiency markets and the perception of high risk are strong barriers to the development of an energy efficiency market in China. Taylor's conversation with one Chinese state-owned enterprise executive was quite telling: In investments in the company "I am not rewarded if I am successful, but, if I fail, I will face consequences."
- *Lack of financing opportunities.* Producers who opt to take the risk of investing in energy efficiency improvements or technology face one other stumbling block—limited financing.

Keys to Success

Although they employed different approaches to improve energy efficiency within China's manufacturing industries, the World Bank and IIEC both were relatively successful in developing energy efficiency markets. Pam Baldinger noted in her comments that while Taylor's project was more narrowly focused than IIEC's, both projects employed three basic strategies that help explain their successful work in China:

- *Focused work.* Knight emphasized in her talk that a narrow, clear project focus was paramount for successful work in China, for if a project can demonstrate concrete results in a single sector, this will create a model for others. Taylor also adopted a narrow focus in his work, for he believed success in creating a small number of demonstration projects would have a bigger impact than trying to implement a larger unmanageable financing project.
- *Sustained dialogue with government and business stakeholders.* Communicating with all levels is crucial for fruitful collaboration in China. For both Taylor and Knight, solely using Western-proven methods, or best practices in other Asian countries, would result in a model ill fit for the unique needs of Chinese stakeholders. For Knight, questions were posed at every stage. To assure clarification, IIEC asked collaborators very literal questions: "This is what we learned from you. Are we right? Here are some strategies. Are we on target?" It was also important to listen to the concerns expressed by users. In order to make investment rational, users wanted a proof of savings. IIEC responded by spelling the savings out. Constant discussions also revealed the danger of assumptions. Knight and her colleagues originally placed branding issues as priority number one; collaborators were quick to insist that government support, crucial for successful business ventures of all kinds in China, should be the top priority. (Knight also suggested that dialogue with international partners, and other organizations working in China can help avoid conflict. Talking with all other parties assures that there are no mixed signals in the market, no tripping over each other in an effort to do different work, no stepping on the toes of groups by redoing work already done.)
- *Strong relationship with the central government policymakers.* Perhaps not unexpectedly, central government support is crucial for the success of international organizations, for high-level approval eases implementation and facilitates sufficient assistance from lower level governments and the business sector. Robert Taylor suggested that only with the help of the SETC was the World Bank able to create the three ESCOs. Having created a wholly new type of company, Chinese auditors and local governments were confused as how to categorize and tax service providers, equipment sellers or finance businesses. Through nine months of government dialogue led by SETC all of these stakeholders made decisions on how to treat ESCOs.

Accomplishments

In their respective energy programs both Taylor and Knight aimed to create a successful model to prompt the development of energy efficiency markets that could be duplicated in industrial sectors throughout China. While the World Bank and IIEC projects were small in scale, they did demonstrate to key stakeholders in China that energy efficiency could produce great savings and give producers a tremendous competitive advantage. The success of the three ESCOs under the World Bank project could be measured by the return on their investments. Of 200 project loans, Taylor reported only three defaults and an average rate of return over 20 percent.

In the case of IIEC, the program succeeded not simply in demonstrating savings in production costs to the participating industries, but more importantly the program changed industry and energy policy. For example, prior to the motor market program there was a limited awareness of energy efficiency products in China among industry leaders and consumers. The program helped generate general knowledge on energy efficiency and motivate Chinese oil industry leaders to request a similar energy efficiency program in their sector. In the policy realm, the IIEC program led to the establishment of a high efficiency voluntary standard for motors in July 2001, followed by high efficiency product certification guidelines, and in January 2002 a minimum efficiency standard.

Other Energy Efficiency Project Work

The World Bank and IIEC are just two of many organizations involved in energy development in China. While insufficient funding has somewhat limited the extent of U.S. government energy efficiency cooperative projects, the foundation and multilateral communities have been key supporters of NGO and multilateral energy efficiency projects in China (For information on current U.S. government and NGO energy efficiency projects in China, click here). The UN Foundation, for example, has dedicated significant funding for renewable energy and energy conservation in China (and has parallel programs in India and Brazil). In China, the UN Foundation's support of energy efficiency projects includes: (1) increasing energy efficiency of industrial boilers and electric motors; (2) accelerating energy efficient appliance standards; (3) increasing energy efficiency financing; and (4) promoting distributed power. The UN Foundation has encountered the same barriers as did the World Bank and IIEC and, notably, employed many of the same strategies to create successful programs. Similar to the World Bank and IIEC, the UN Foundation also has sought to demonstrate market-oriented approaches in select areas and industries, which encourages interested industries to replicate the successful models.

Future Issues

The success of energy efficiency programs in China, demonstrated by the World Bank and IIEC illustrates the potential for similar programs. While the Chinese government has focused much of its regulatory efforts on the industrial sector, household-level energy use has been relatively ignored. For example, most apartments in China lack wall and ceiling insulation, double-glazed windows or individual temperature controls. Robert Taylor suggested that the best strategy for improving energy use in the household sector would be to focus on an agenda of code enforcement and heating policy reform. Beijing issued building energy efficiency codes—first in 1985 and more recently, 1996—yet neither code has been implemented. In conjunction with code enforcement, heating reform is integral to furthering the advancement of energy efficiency in the household sector. The main obstacle to reform in this sector is that heating still is provided as welfare in China and not treated as a commodity. Generally, employers, not individuals, pay heating bills. Moreover, Chinese consumers have no control over the meter, the price, or the bill. With no individual responsibility in the heating system, there is no way to motivate conservation or promote energy efficient heating at the consumer level.

Forging an Energy Efficient Economy

In addition to World Bank, IIEC, and UN Foundation programs, the development of energy efficiency markets in China should be facilitated by China's entry into the WTO. To truly reinvent its economy as more energy efficient the Chinese government must: (1) help create the right incentives to attract China's domestic banking industry as a source of financing; (2) encourage Chinese industries to prioritize energy efficiency; (3) take ownership of already established energy efficiency programs; and (4) together with the business sector prioritize the role of energy efficiency in building and maintaining a competitive economic advantage

Green Activism and Civil Society in South Korea

26 February 2002

Seo Wang-Jin, Citizen Movement for Environmental Justice

Kim Je-Nam, Green Korea United

Stephen Costello, The Atlantic Council (Commentator)

Editor's Note: Periodically, the China Environment Forum devotes meetings to environmental issues in other Asian countries that might offer insights into environmental developments in China. There are certainly great differences between the Korean environmental movement that began a decade before the Chinese environmental NGO community emerged—one striking difference is that the Korean green organizations have been much more protest and anti-industry oriented than any of their Chinese counterparts. Chinese and Korean environmental movements do, however, have some commonalities—today environmental activists in both countries appear to be searching for a clear mission for the future and the means to strengthen their influence in the political sphere. For more in-depth information on the Chinese NGO movement, see the Wilson Center's Green NGO and Environmental Journalist Forum publication available at http://ecsp.si.edu.

By Yon-ho Kim (Atlantic Council)

The environmental movement in Korea is characterized by grassroots activists seeking to influence policy and challenge powerful polluting industries. In response to the environmental degradation caused by South Korea's high-speed industrialization, small anti-pollution groups arose in the early 1980s. In the 1990s as more "green" groups emerged, Korean environmental activists created larger umbrella organizations to empower themselves.

This meeting held at the Wilson Center and cosponsored by the Atlantic Council's Program on Korea in Transition brought Korean environmental activists together to discuss the strength of the environmental movement in South Korea and the challenges they face in carrying out their work. The discussion also addressed the broader role of green organizations and other civic groups in Korea and their potential influence in the upcoming elections.

Fighting Development Forces and Raising Public Awareness

Seo Wang-jin started his remarks with an introduction of his organization, Citizen Movement for Environmental Justice (CMEJ). In 1999, Mr. Seo founded the CMEJ, which has since become one of Korea's fastest growing NGOs focusing on environmental justice and the fair distribution of natural resources. The group's activities have concentrated on promoting children's environmental rights and stemming the environmental degradation from large-scale construction projects initiated by the government. In describing the trends of the South Korean environmental movement, Mr. Seo pointed out that his and other groups fight against the construction of dams, housing complexes, canals, and reclamation projects.

Since the 1960s these projects have been a stronghold of development-oriented bureaucracies—the Ministry of Construction and Transportation and Ministry of Agriculture—and government contracted private engineering and construction companies. Although there is not a desperate need for many of these large-scale construction projects, the government and business development-oriented "forces" keep pursuing the projects to serve vested interests. Mr. Seo noted, however, that growing concern for the environment in Korea has led to severe frictions between these forces and environmental civic groups.

The campaign to save Dong River on Korea's east coast from dam construction in 1999 is an excellent example of this hostility. The government emphasized the necessity and importance of the project due to water shortages made worse by a short rainy season in that area of the country. The green civic groups opposed the project because the ecology in the Dong River area was exceptionally well preserved. Moreover, such a large-scale dam could threaten the safety of surrounding communities. Seo explained that the efforts of several civic groups to educate and mobilize citizens through the news media led President Kim Dae Jung to announced the cancellation of the project on World Environment Day in June 2000. The Dong River case proved to be a major turning point for the Korean environmental civic group

movement, for it was one of the first times they succeeded in such a large public awareness and mobilization campaign. The case also illustrated the changing political environment in which sustainable development issues rose to the level where the Korean president became directly involved.

While the Dong River case was a battle environmental civic groups won, the Saemankeum wetland case was one they clearly lost. Despite protests, the Ministry of Agriculture proceeded with a large-scale reclamation project in Korea's southwest region, claiming the project would create 28,300 hectares of farmland. Farmland is a major concern, for 30,000 hectares of agricultural land disappear every year in Korea due to changes in land use. Despite the need for agricultural land, environmental civic groups pointed out that the Saemankeum area is one of the world's five most ecologically important mudflats and a crucial feeding ground for migratory birds. In 2001, the government decided to go ahead with the controversial project with strong support from the local government and residents who were seeking economic development benefits from the project.

Stephen Costello

With growing public awareness and strong vested interests of the development-oriented forces, conflicts over large-scale government-initiated construction projects should become even more pronounced and receive a greater amount of attention from the Korean public. In an effort to redirect government policies, Korean environmental civic groups are planning to influence the next administration's organization of the cabinet following its inauguration in February 2003.

Political Activism of Korean Green Groups

In 1994, Kim Je-nam joined Green Korea United (GKU), the second largest environmental NGO in Korea, which acts as an umbrella organization for many smaller green groups. In her work Ms. Kim coordinates every NGO's stance on currently debated environmental issues, mediates agreements among environmental NGOs, government agencies, and businesses, as well as informs the Korean President on the outcomes of these dialogues. Ms. Kim described GKU an example of environmental NGOs working at the intersection of environmental and political issues. Among this NGO's major activities is the environmental monitoring of U.S. military bases in Korea—GKU has collected data on noise, water, and soil pollution problems, which the Korean government has not previously tracked. Last year GKU exposed an incident in which Yongsan Base, located in the heart of Seoul, illegally discharged toxic chemicals into a river. As a result of GKU's publicizing of the pollution, the commander of U.S. Forces Korea apologized publicly for the illegal discharge—the first apology of its kind in fifty years of U.S. military presence in Korea.

GKU and other green groups have been involved in drafting laws and trying to influence legislation in the National Assembly. Such work is particularly challenging for most environmentalists believe the Kim Dae Jung government's "vision" is insufficient to protect natural resources. One positive action did occur in 2000 when the Kim government formed a "sustainable development committee," which brought together industry, government, and environmental group leaders for consultations. The Korean environmental ministry now holds these consultations four times per year with twenty leading green NGOs, but the committee is perceived to be a weak force within the government.

In addition to policy efforts and environmental campaigns directed at the national government, Korean environmental civic groups are involved in various grassroots political activities. For example, the Civil Action for the 2000 General Election (CAGE)—consisting of 423 civil organizations (including a number of green groups)—successfully launched a "blacklist" campaign in 2000. The blacklist campaign was established to single out politicians they felt were "not qualified to run" due

to positions on environmental and social issues. Of 86 blacklisted candidates, more than 60 percent failed to win their election. In the upcoming 2002 local elections, environmental civic groups are planning to politicize green forces even further by establishing a Green Party and supporting green candidates—ostensibly creating a "white list" rather than a black list campaign.

While working locally is central to Korean environmental activists, Ms. Kim noted that their contacts with international organizations grew considerably in the late 1990s, due in part to the openness that accompanied the Kim Dae Jung government when NGOs were legalized and their political participation sanctioned. Ms. Kim also discussed how environmental degradation in North Korea is an increasingly important issue for the South Korean green movement, which supports current government efforts to plant trees in North Korea and protect the environment surrounding the DMZ. She believes the South Korean groups could best help the North by advocating the provision of small-scale, renewable technologies for industry. One challenge for such work, however, is the current lack of NGO counterparts in North Korea.

Korean green civic groups undertake activities beyond the environmental sphere. In fact, Ms. Kim noted that Korean environmental groups are sometimes criticized for being "department store" advocacy groups, because they attempt to address a large number of issues both within and outside the environmental sphere. While Ms. Kim agreed that Korean environmental NGOs need more focused missions, she was a strong supporter of how active some green groups are in the anti-war and peace movement. Some green groups joined other civic groups in the anti-war movement at the onset of the war in Afghanistan. Kim expressed the Korean civic groups' hope of seeing the Korean peninsula become part of an "axis of peace" as opposed to an "axis of evil."

Civic Groups and Korean Democratization

In a brief review of the role of environmental groups in the Korean democracy movement, Stephen Costello noted the connection between a lack of democratic institutions and environmental degradation that can be found in Russia, China, Eastern Europe, and other one-party states in transition. In Korea, the authoritarian structure and rapid industrialization of recent decades have created similar environmental problems as are occurring in other one-party states.

As the Korean government now becomes more accountable and more responsive to interest groups—on all sides of environmental questions—the civic leadership must try to organize and set priorities. The "department store" advocacy noted by Kim may serve to weaken the movement. Effective policy advocacy will also rely to a great extent on dialogue with the government and industry groups. How such a dialogue is conducted will often make the difference between having influence and just blowing off steam.

Added to this is the question of "green" involvement in party politics. As Ms. Kim Je-nam noted, some Korean green groups do not want to become direct participants in the political system and instead wish to rely on public participation and support for their power and legitimacy. Costello noted, however, that the formation of a Green Party and the participation of individual activist leaders as candidates in other parties will be an essential element in keeping these issues on the public agenda in Korea.

The Atlantic Council of the United States and the Wilson Center's ECSP China Environment Forum and the Asia Program cosponsored this meeting. Funding for this meeting was provided by the Korea Foundation.

Tokyo Workshop on U.S.-Japan Environmental Cooperation: Promoting Sustainable Development in China

6 March 2002

By Richard Forrest and Jennifer L. Turner

This second workshop in the series complemented the 20 November 2001 workshop in Washington DC by adding new voices and proposals for future U.S.-Japan cooperation. The Tokyo workshop, hosted by the Woodrow Wilson International Center for Scholars with the cooperation of the U.S.-Japan Public-Private Partnership (P3) and the Japan Civil Society Organization (CSO) Network, brought together some 40 experts from foundations, corporations, government, academia and NGOs to explore prospects and opportunities for U.S.-Japan cooperation to address environmental challenges in China.

Participants were welcomed to the workshop by **Yukio Oshida**, on behalf of the Japan Foundation Center for Global Partnership (GCP), which provided financial support for both the Washington and Tokyo workshops and the meeting venue for the Tokyo workshop. Mr. Oshida noted that sustainable development has emerged as a priority area for CGP support.

U.S. and Japanese Environmental Cooperative Activities in China

In the workshop's first panel the speakers provided overviews of the status of environmental cooperative efforts in China by the United States and Japan.

United States Green Work in China

Jennifer L. Turner of the Wilson Center summarized U.S. governmental and nongovernmental activities on the environment in China. According to Dr. Turner, based in large part on the U.S.-China Science Technology Cooperation Agreement (signed in 1979), 30 protocols guide U.S. activities on conservation, atmosphere, ocean, air pollution, and renewable energy, with 16 agencies undertaking 80 projects in 2001 and 103 projects in 2002. However, due to the lack of Congressional funding, U.S. environmental and energy-efficiency activities mainly consist of workshops, trainings, and joint research. This stands in stark contrast to the large number of loans and grants provided by the Japanese government to China for environmental activities.

Despite the limited governmental funding, U.S. government environmental and energy activities in China have helped to design policies and regulations, set standards for energy-efficient products, and investigate global atmospheric trends. Examples of U.S. government projects include the Air Quality Monitoring Network established in 40 Chinese cities, which has promoted greater access to information about the problematic state of China's air quality. Training courses by U.S. agencies have covered a broad range—including natural gas utilization, energy and environmental modeling, ecotourism, and air quality and health impact assessments. Since January 2001, some new congressional funding has been made available to the U.S. Trade Development Agency (TDA) for feasibility studies for environmental and energy technological assistance to China. Additionally, the law granting permanent normalized trade relations with China promotes support for increasing the rule of law in China, which led to support for the American Bar Association (ABA) China environmental governance project. This ABA project began in February 2002 and will set up environmental law training programs in three Chinese cities for lawyers, judges, and local policymakers. Drawing from within its own budget, the U.S. Department of Energy also provides numerous grants to U.S. NGOs and national laboratories to do energy work in China.

U.S. NGOs are very active in China, with at least 40 American NGOs undertaking projects. Their major foci are energy-efficiency, biodiversity conservation, and environmental education. These NGOs have been very innovative in promoting policy developments, standard setting, market creation for energy efficiency technologies, and more efficient nature reserve protection strategies. U.S. NGOs also have played an important role in building bridges and cooperative relations between local governments, Chinese NGOs, and Chinese industries.

Japanese Green Work in China

Naohiro Kitano of the Japan Bank for International Cooperation (JBIC) outlined Japan's policy on Official Development Assistance (ODA) for China. In particular, the Japanese government's policy for economic cooperation for China announced in 2001 and JBIC's "Medium-term Strategy for Overseas Economic

Cooperation Operations" both emphasize the importance of environmental protection, along with education and poverty alleviation. JBIC began supporting environmental projects in China in 1989, with a cumulative total of $4 billion already provided. A very significant share—20 percent—of all Japanese ODA for China is for "environmental" projects, such as sewage treatment plant construction and water supply projects.

JBIC does not provide technical assistance directly, but coordinates collaboration between municipal governments to supply aid. One example of a JBIC supported project was the Beijing Sewage Treatment Plant Construction Project, which involved collaboration with local governments, including the Tokyo municipal government. Another more recently JBIC-supported activity has included comprehensive pollution control in river basins. The Environment Model City Project—supported by an experts committee and numerous Japanese government agencies—has promoted the diffusion of pollution prevention strategies and technologies in Chongqing, Guiyang, and Dalian. Future challenges for JBIC's cooperation with China include setting up projects in new areas such as energy efficiency, automobile pollution reduction, solid waste management, and recycling. In general, JBIC has been expanding its relationships with NGOs and the JBIC Beijing office is eager to participate in international NGO meetings.

Hidefumi Imura, professor at Nagoya University and a researcher with the Institute for Global Environmental Strategies (IGES), concluded the overview session by explaining the need to take into account the difficult historical relationship between Japan and China in conducting cooperative activities. He also believes there is a great need to create a new relationship for the 21st century. Sino-Japanese trade and exchanges in various policy sectors, especially the environment, have increased significantly in recent years. To facilitate exchanges and joint research in the environmental sphere, the Japanese government provided grants for the construction of the Japan-China Friendship Environmental Protection Center in Beijing.

Dr. Imura noted that, whereas the role of NGOs is important in U.S. environmental cooperation with China, local governments, in contrast, play a significant role in Japanese environmental cooperation with China. The sister city relationship between Kitakyushu and Dalian has included considerable training and exchanges on municipal environmental management and policies. Commercial firms are also likely to be a promising channel for transferring environmental technologies from Japan to China. In terms of bilateral government cooperation, Japan's relations with China are overshadowed by historical strains. Therefore multilateral cooperation will be a more promising venue for Japanese government environmental work in China. As an example, he cited the East Asia Acid Deposition Monitoring Network, which consists of ten countries, including Japan and China, and the trilateral Environment Ministers meeting involving Japan, China, and Korea, which already has convened three times. Dr. Imura felt that for future Japanese environmental work to be more successful in China, activities should shift from economic and infrastructure assistance to education and human skills development. Japan should shift from "aid" to "cooperation," engaging in a common search with China for solutions to pollution and natural resource degradation issues.

Professor Imura concluded that U.S.-Japan cooperation for the environment in China is possible, but that government-level cooperation would be difficult due to divergent environmental policies and priorities in both countries. Technology transfer through commercial channels would be much more promising, although it may induce U.S.-Japan competition. U.S.-Japanese NGO cooperation could therefore play a key role in the future, but unlike the United States, the number of environmental NGOs in Japan is small and funding is scarce. Imura felt that a framework that could promote both governmental and NGO partnerships for the environment should be established to promote U.S.-Japan joint environmental initiatives in China. (*Editor's Note: See the Inventory of Environmental Projects in China in this issue of the China Environment Series for an extensive, up-to-date list of U.S. and Japanese government projects and international NGO activities in China*)

OVERVIEWS OF ONGOING ACTIVITIES

The second panel at the workshop—Overviews of Ongoing Activities—delved deeper into the progress and lessons of energy and climate change assistance to China, which hold potential for future U.S.-Japan environmental cooperation. **Aki Mauryama**, research associate of IGES, gave a presentation on "Issues in International Cooperation for Climate Change Mitigation in China: The Case of Power Generation." She noted that while special mechanisms were agreed to under the Kyoto Protocol for developed countries to provide assistance to developing countries, technology transfer for CO_2 mitigation to China is hampered by: (1) the fact that domestically abundant coal is widely used in China; and (2) the predominance of small, old, inefficient power plants. She explained that China's share of CO_2 emissions

in the region is large, and the largest contributor of CO_2 emissions in China is fossil fuel use, especially coal—80 percent of which is used for power generation. Over the last six years, CO_2 emissions in China have been shrinking, but economic growth and population increase will lead to greater electricity consumption and coal will continue to be used. Therefore, shifting power generation to renewable sources and promoting energy efficiency are urgent tasks for China. Funding mechanisms also are needed to finance the additional costs of clean coal technology (CCT).

China's domestic policies should be reformed to promote improved and more sustainable energy production in areas such as: (1) fuel pricing (e.g., eliminating governmental subsidies for coal); (2) providing favorable tax treatment for environmental investments; (3) improved environmental regulation, monitoring, and compliance mechanisms; and (4) government support for research, development, and coordination with nongovernmental organizations. Lack of clarity in policies and regulations—particularly insufficient protections for intellectual property rights and convoluted approval processes—currently discourages innovative investment in the energy sector, although China's entry into WTO may improve the situation. Dr. Aki Mauryama concluded that to promote future investment and technology transfer for environmental protection in China, environmental legal assistance to improve the legal framework would be crucial. The United States and Japan could play an important role in this area if there was cooperation on environmental law and governance, akin to the newly initiated American Bar Association training program.

Kevin Maher, minister counselor for science and technology at the U.S. Embassy in Tokyo, noted in his presentation on "U.S.-Japan Cooperation on Global Environment Issues," that the scientific research on atmospheric issues promoted through U.S.-Japan cooperation might be beneficial for application in China in the future. Nevertheless, he indicated that the U.S. government does not recognize sufficient scientific basis behind numerical CO_2 reduction targets, challenging the consensus of scientific experts. In the subsequent discussion, it became evident that the U.S. stance on the Kyoto Protocol is considered a major hindrance to enhanced and expanded U.S.-Japan environmental cooperation.

Professor **Hideki Shiroyama** of the University of Tokyo in his presentation "Analysis of Japan's Green Aid to China" explained that while Japan has supported financing for the construction of more efficient boilers for coal power plants in China, plant maintenance (critical for maintaining efficiency) is not well supported. Improvements for boilers in small- and mid-sized industries, of which there are an estimated 300,000 to 400,000 in China, is a necessary but difficult task due to high costs. Dr. Shiroyama reiterated that China's low priced coal, lack of regulations, and shortage of financing provides disincentives for energy-saving investments. The combination of environmental challenges and the transition to the market economy mean that pollution problems are difficult to solve. Assisting technology transfer, especially through innovative financing arrangements, would appear to be one of the most promising areas for future U.S.-Japan cooperation on the environment in China.

Kenji Otsuka, of the Institute for Developing Economies (IDE), presented "Research Cooperation to Promote Capacity Building for Sustainable Development in China." He noted that cooperation between Japanese and Chinese social science research institutes and environmental policy research centers is taking place. Such collaborative efforts have led to surveys of public attitudes toward the environment and green activities of businesses—the latter surveys could be especially useful in designing technology transfer programs. It will be important to transfer the results of these bilateral research efforts to the policymakers in China and Japan. IDE also cooperated with the Center for Legal Assistance to Pollution Victims (CLAPV), which conducts telephone counseling and legal support for pollution victims in China. He concluded that social science research cooperation with Chinese environmental institutions is vital, given the limitations imposed on investigation by foreigners and inaccessibility of original data. Moreover, Chinese partners have a better understanding of the local political and social dynamics and such collaboration promotes capacity building for Chinese research institutions. (*Editor's Note: For more information on CLAPV and cooperation with Japan see Kenji Otsuka's commentary in this issue of the China Environment Series*)

Opportunities for New Cooperation

The workshop's concluding session, a roundtable discussion, invited participants to: (1) identify sectors that should be prioritized in U.S.-Japan environmental cooperation to benefit China; (2) highlight next steps that should be taken to promote such cooperation; and (3) identify potential obstacles to U.S.-Japan collaboration in China.

Roundtable presenters included **Chimaki Kurokawa**, managing director of the Toyota Foundation, who

explained that the Toyota Foundation supports environmental research activities, including funding for afforestation efforts in Inner Mongolia by Tottori University and protection of the Yangtze River dolphin. Mr. Kurokawa noted that the environment provides a favorable sector in which to promote bilateral cooperation between China and Japan, but multilateral frameworks and the cooperation of NGOs is important and should be much further developed, which could open up initiatives with U.S. organizations and agencies.

Senro Imai of the Japan International Cooperation Agency (JICA) indicated that China's central government is eager to avoid environmental and pollution problems becoming political controversies. Whereas in Japan the political system worked as a safety valve to bring pollution problems to the attention of the government and thereby led to solutions, there are few opportunities for electoral or public pressure to influence the government on environmental issues in China. Nevertheless, China allocates 1.03 percent of its GNP, an exceptionally high proportion for a developing country, to environmental investments. He believed that supporting the role of local governments and participation by citizens in environmental protection activities will be a crucial task for Japan and other countries working in China. Supporting environmental legal reforms, as well as the training of lawyers, are also promising areas of U.S.-Japan collaboration.

Manabu Tani, president of the Green Blue Corporation, discussed how his company aims to help develop the market for environmental monitoring in China. Mr. Tani recalled that careful monitoring of industry and environment allowed Japan to overcome severe pollution problems in the 1960s and 1970s. Such monitoring and data collection should be able to play a similarly beneficial role in China. While Japan has 2,000 automatic air-monitoring stations, China only has 98 in sixteen cities. He proposed that U.S.-Japan environmental cooperation for China focus on developing the market for environmental monitoring systems.

Byron Sigel, Japan representative for The Nature Conservancy (TNC), explained how around the world TNC undertakes conservation of biological diversity in a collaborative, science-based, and entrepreneurial manner. TNC has a project in Yunnan Province in southwest China that focuses on promotion of alternative energy, tourism, and reforestation, while also being mindful of the cultural diversity of the area. He suggested reforestation and ecotourism projects that benefit local communities would be especially promising areas for U.S.-Japan cooperation. He stressed, however, that to promote U.S.-Japan cooperation—particularly between NGOs—Japan's ODA system would need to be made less bureaucratic and more decentralized to help promote such cooperative initiatives.

Asuka Jusen, professor of Tohoku University, indicated that it would be difficult to convince Chinese authorities to tackle the climate change issue when Japan and the United States have not demonstrated a model of success, such as through the introduction of a carbon tax to reduce their own greenhouse gas emissions. For U.S.-Japan environmental cooperation in China and elsewhere to succeed, information exchange and joint study and research should be promoted, including the joint development of international markets for carbon emissions reductions credits.

FUTURE ACTION

The workshop concluded with recommendations for future action. While participants agreed that U.S.-Japan cooperation for the environment in China would be valuable, they recognized that difficulties remain, and that steps would need to be taken to improve prospects for the future. Such steps could include:

- Creation and support of networks to share information within Japan, between Japan and the United States, and between Japan, the United States, and China. Such networks could speed up the diffusion of knowledge, catalyze partnerships and "match-make" among NGOs and government agencies for effective joint activities;
- Internet-based information exchange systems in multiple languages;
- Creation of a joint research forum for American and Japanese experts to evaluate and promote environmental technology transfer to China;
- Increased cooperation with local governments in China, such as "sister city" relationships—trilateral "sister city" cooperative projects that focus on municipal environmental infrastructure and financing could be one promising avenue for U.S.-Japan environmental cooperation in China;
- The Japan-China Friendship Environmental Protection Center in Beijing could be used for matchmaking of NGOs and other U.S. and Japanese institutions working for environmental issues in China;
- Promote joint U.S.-Japan environmental education initiatives, which in the long term will help build domestic Chinese support for improved environmental policies and investments, and,

• Joint training projects by U.S. and Japan law associations and NGOs to promote better enforcement of environmental laws in China.

The workshop organizers concluded that the Tokyo workshop was successful in identifying many views and challenges regarding U.S.-Japan environmental cooperation in China, and that future workshops should be undertaken and include broader participation of local government officials and researchers from the United States and Japan.

Editor's Note: The Wilson Center and P3 would like to acknowledge the efficient assistance of Yoshiko Hattori and Kumiko Mima from the translation company Diplomatt in writing the initial transcript for this meeting summary.

We are also grateful to Shunsuke Sogo (CGP) for his enthusiastic assistance in helping the meeting run smoothly.

Film Screening of *Herdsmen* at the Environmental Film Festival in the Nation's Capital 15 March 2002

ECSP's China Environment Forum screened the film *Herdsmen* during the 2002 Environmental Film Festival in the Nation's Capital (http://www.dcenvironmentalfilmfest.org). The film is a documentary that tracks a Kazak family in Xinjiang—China's western-most province—with two cameras over the course of a year from spring to winter. The Kazaks are ethnically related to the people of Kazakhstan and speak the same language. While Kazakhstan was molded by the Soviets into a nation of farmers and workers, the Kazaks of Xinjiang have retained their nomadic life and their bond with nature and love for animals, especially horses. The Kazaks are a small minority among the many more tenacious peoples of Xinjiang. Therefore to survive, the Kazaks went their way among the mountains and plateaus of the most remote region of China.

The 90-minute film was cut from 2,500 minutes of footage, a four-year effort by an all-Chinese film crew (Wei Bin, executive producer; Luo Ming, producer; Chen Jianjun, director; Shen Jian, photojournalist). The crew followed a typical nomad Kazak family of 11 children as the family moved wherever there was grass for their beasts. The family endured incredible hardships, sometimes going several days without food. In spite of these challenges the film shows the family enjoying many moments of joy and beauty—sustained by faith that nature will support them. The film is stunning in its cinematic style, taking a classic ethnographic approach—purely observational with no interviews and no outside narration.

(Information on the film available at: http://www.der.org/films/herdsmen.html)

The Integrated Energy Options and Health Benefits Study for Shanghai, China

22 March 2002

Chen Changhong, Shanghai Academy of Environmental Sciences

Fu Qingyan, Shanghai Academy of Environmental Sciences

Li Jia, Center for Clean Air Policy

Susan Wickwire, U.S. Environmental Protection Agency (Opening Remarks)

By Collin Green (NREL), Timothy Hildebrandt, and Jennifer L. Turner

For the past three years, the U.S. Environmental Protection Agency (EPA) has supported a cooperative project with the Chinese State Environmental Protection Administration (SEPA) to estimate how the implementation of clean energy and transport technologies, policies, and programs could benefit local air pollution and linked human health problems, as well as reduce greenhouse gases (GHG). This program falls within EPA's integrated environmental studies (IES) program, which promotes an integrated environmental policy analysis framework by linking policy analysis and implementation of air pollution and GHG mitigation measures through analyses of emission inventories, air quality modeling, and air pollution health effects (See Box 1). The object of this comprehensive policy analysis framework is to provide decision-makers with robust information on the costs and benefits of specific policy measures. Members from the Chinese team presented the results of this study at a March China Environment Forum meeting at the Woodrow Wilson Center.

The initial phase of this China IES project was implemented in Shanghai in cooperation with the Shanghai Academy of Environmental Sciences (SAES) and the Public Health Department of Fudan University. The project received support from the China Council for International Cooperation on Environment and Development (CCICED), World Resources Institute (WRI), National Renewable Energy Laboratory (NREL), EPA, and the Shanghai Environmental Protection Bureau (SEPB).

The Shanghai project team has recently completed a comprehensive study—*Integrated Assessment of Energy Options and Health Benefits*—for Shanghai for the period 2000 to 2020. This is the first time Chinese experts have carried out an integrated study linking analysis of energy options, air quality, and economic value of anticipated health impacts.[1] The study demonstrates that fuel substitution, efficiency improvements for boilers, and a city-wide cap on SO_2 (sulfur dioxide) emissions provide effective pollution reduction opportunities to improve local air quality with significant health benefits while simultaneously reducing GHG emissions. The analysis estimates that these measures would prevent 3,000 deaths/year and provide a range of other health benefits, with a total economic value of over $500 million per year by 2010. The Shanghai municipal government already has incorporated results of this study into their planning and policies including the "10th Five-Year Development Plan for Shanghai Social Economic Development."

Current Environmental Quality in Shanghai

To fuel China's economically dynamic cities energy demand has been increasing considerably. As a result of high energy consumption and the use of low energy-efficient technologies, polluting emissions have risen in many Chinese cities. Air pollutants have caused serious environmental problems in China and growing CO_2 emissions have contributed to the worldwide increase in greenhouse gas concentrations. Aware of the unsustainability and environmental damage of current energy consumption, the Chinese government has made great efforts in energy conservation, energy efficiency, and population control. For the past few years the rate of energy consumption in China has been increasing more slowly than the rate of national economic growth.

With a high rate of economic growth, the living standards, per capita gross domestic product (GDP), per capita energy consumption, and energy application technology of citizens in Shanghai are higher than the national average and among the most advanced in China.

Box 1. U.S. EPA's Integrated Environmental Strategies (IES) program

Many countries are struggling to balance economic development, long-term environmental risk minimization (i.e., global change), and critical near-term environmental concerns (i.e., improvements in air quality and human health). Effective integration of climate change and local environmental strategies can make use of limited resources for greenhouse gas emissions reduction and other national and local environmental protection programs simultaneously. To assist developing countries in meeting this need, the U.S. EPA's International Capacity Building Branch of the Office of Atmospheric Programs initiated the Integrated Environmental Strategies (IES) (www.nrel.gov/icap) in 1998 to support and promote the analysis of the public health, environmental, and economic benefits of integrated strategies for GHG mitigation and local environmental improvement in developing countries. Government agencies and research institutions in Argentina, Brazil, China, Chile, South Korea, India and Mexico are participating in the IES program, and South Africa is considering joining soon. The International Energy and Environmental Applications Office of the National Renewable Energy Laboratory assists EPA with the implementation of the IES program.

For years, the Shanghai municipal government has made great efforts in energy and environmental protection. Many of the implemented policies have increased energy savings, as well as strengthened controls on coal consumption, fuel content, smoke and dust, and end-of-pipe technologies. The experiences and lessons of Shanghai in economic development, energy consumption, and environmental protection will inevitably influence other major cities in China.

Shanghai lacks energy resources and depends on energy delivered from other provinces in China, mainly in the form of coal and crude oil. From 1996 to 1998, total average end-use energy consumption was 1813 PJ (peta joules) per year. By 2020, total end-use energy consumption is expected to increase to 1907-2744 PJ. Shanghai strictly controls the sulfur quantity in fuel, and although energy consumption has increased over the past years, SO_2 emissions have not; in fact the 1998 emissions were lower than in 1996 and 1997. However, total CO_2 emissions from fossil fuel burning have increased by more than 100 million tons each year since 1994. Moreover, coal-burning pollution control measures intended to reduce NO_x (oxides of nitrogen) emissions have not been effective.

Projections of Energy and Air Pollution in Shanghai

Chen Changhong and Fu Qingyan from SAES provided a succinct overview of how the projections for the study were set. The project used 1995 figures as the basis for projecting energy demand per sector and GDP. The projected GDP growth rate of 9 to 11 percent for the short-run was taken from "The Tenth Five-Year Plan." The energy demand levels per sector were forecasted by using historical data on the elasticity of final energy consumption; the figures were then translated by applying the energy efficiencies for current energy technologies. Assumptions regarding energy and fuel supply availability included the following:

- Natural gas availability was constrained by existing supplies, that is, natural gas from sources outside China was not considered;
- Availability of coal was assumed to be unlimited; electricity supply would be met by sources from Shanghai;
- Additional imports from nuclear and hydro sources outside Shanghai were not considered; and,
- No additional changes were assumed in energy and environmental policy such as those being developed in the Tenth Five-Year Plan.

The alternative energy and emission scenarios were derived from China's *Agenda 21-Shanghai's Plan of Action,* and Shanghai's Tenth Five-Year Plan. Three types of alternative scenarios (main assumptions are summarized in Table A) were developed from the base case (BC):

(1) Implementation of alternative energy options—Energy Option Scenario
(2) Setting new environmental emission targets—Environmental Targets Scenario
(3) Implementation of carbon emission control through a carbon tax—Carbon Control Scenario

Analysis of Health Impacts Resulting from Changes in the Energy Structure and the Enforcement of Environmental Policies

Li Jia from the Washington DC-based Center for Clean Air Policy discussed the health analysis part of the

Table A. Characteristics of Future Energy and Environmental Policies

Scenario	Future Energy and Environmental Policies	Indicators
Energy Options	Energy efficiency in coal facilities	5-10% improvement 1995-2020
	Limit total coal consumption in Shanghai	Less than 50 Mt, 2000 onward
	Limit total capacity of coal fired power generation	Less than 12 GW, 2000 onward
	Import natural gas from Western China	3-4 billion cubic meter per year starting at 20003 (117-156 PJ)
	Import electricity from 3 Gorges Dam	3 GW, 2010 onward
	Import electricity from Qinshan Nuclear Power Station	0.3 GW 2010 0.65 GW 2015
	Import liquefied natural gas (LNG)	5-6 million tons 2010 onward
	Build wind turbine	0.06 GW, 2005 0.30 GW 2015 0.60 GW, 2035
	Substitute coal with natural gas	35% of end-use coal (2005); 90% (2035)
Environmental Targets	Reduce 20% SO_2 emissions by 2005 on base year 2000	Emission limit of 372 kiloton (kt)/yr, 2005 onward
	NOx emission control targets for transportation sector	Emission limits: 61 kt/yr, 2005; 25 kt/yr, 2020 onward
	NOx emission control targets for all sectors	Emission limits: 391 kt/yr, 2005; 325 kt/yr, 2020 onward
	PM_{10} emission control targets for mobile sources	Emission limits: 7 kt/yr, 2005; 3.5 kt/yr, 2020 onward
	PM_{10} emission control targets for non-mobile sources	Emission limits: 100 kt/yr. 2005; 70 kt/yr, 2020 onward
Carbon Control	CO_2	200 Yuan/t, 2015 onward

study. She explained that the health-based risk assessment approach (including hazard identification, exposure assessment, dose-response assessment, and risk characterization), combined with an increase in health damages per unit increase of air pollutant, was used to estimate the health effects associated with air pollution in Shanghai. Based on the Shanghai Environmental Geography Information System, the human exposure levels to PM_{10}[2] and SO_2 associated with energy consumption were assessed for each four-km^2 grid across the entire city of Shanghai. By combining the change in population exposure levels to PM_{10}, (which was used as an indicator of total air pollution, exposure-response functions, and baseline rates for the health outcomes) the health effects under various energy scenarios relative to the base case scenario were estimated for 2010 and 2020. This portion of the study indicated that the implementation of various energy scenarios in Shanghai could have significant positive impact on the health status of Shanghai residents. Table B shows the range of potential

health benefits from the energy options and environmental scenarios.

The effect of air pollution on mortality was assessed by using the value of a statistical life (VOSL). The effect of income on the VOSL also was taken into account for the value transfer. Prior to this study there were no willingness-to-pay (WTP) studies for different endpoints of morbidity in China. Therefore, an alternative approach was taken to infer a WTP value. The unit values for various endpoints are expected to increase annually using a constant growth in per capita income of four percent, which was estimated according to the Shanghai GDP growth scenario and the relationship between resident income and GDP growth in China. The value of a change in the incidence of a given adverse health outcome was calculated as the change in incidence multiplied by the unit monetary value.

Table C presents the average economic benefits of different scenarios with respect to the base case scenario. Estimates for the economic benefits and potential avoided health impacts were calculated for both mortality and morbidity end points. The analysis was mainly based on the result of a study on the WTP for a reduction in mortality risk related to air pollution, which was conducted in Chongqing, China. Air pollution also affects human morbidity and therefore the valuation of illness and disability is important for assessing the total social costs of air pollution. This analysis used either the WTP approach or the conflicts of interest (COI) approach to value the morbidity outcomes associated with air pollution.

Conclusion

Energy and health policy under high economic growth conditions is one of the biggest challenges facing Shanghai. The *Integrated Assessment of Energy Options and Health Benefits* study provides an opportunity for Shanghai to assess future environmental risks and potential responses. The results illustrate that an effective energy and environmental policy could play a key role in emissions reduction, air quality improvement, and health benefits.

This analysis emphasizes the need to consider air pollution-related health effects as an important impact of energy policy options in Shanghai and illustrates that close collaboration between public health and energy policy could prevent serious health hazards. Moreover, the approaches recommended in this analysis could be applied to other regions of China for local and nationwide air pollution-related health risk assessments.

A policy workshop was held in Shanghai in February 2002 to review the results of this study, discuss policy implications, and identify priorities for further cooperative efforts. The workshop included

Table B. Health benefits in Different Scenarios with Respect to Base Case (BC) Scenario

Health Endpoint	Number of cases prevented in 2010 (mid-range values)	Number of cases prevented in 2020 (mid-range values)
Premature avoidable deaths	647-5,472 deaths	1,265-11,130 deaths
New cases of chronic bronchitis	1,1315-11,100 cases	2,580-22,620 cases
Cases of respiratory hospital admission	260-2,260 cases	486-4,485 cases
Cases of cardiovascular hospital admission	260-2,260 cases	486-4,485 cases
Internal-medicine outpatient visits	27,080-237,900 visits	49,850-468,600 visits
Pediatrics outpatient visits	2,807-24,660 visits	5,173-48,590 visits
Cases of acute bronchitis	49,490-414,200 cases	98,520-850,000 cases
Asthma attacks	1,508-12,790 cases	2,937-25,960 cases

representatives from the national (SEPA and CCICED) and local (SEPB and the Shanghai Public Health Bureau) levels, as well as technical experts from Shanghai and the United States.

Study results and actual measurements presented at the workshop indicated that fuel substitution, efficiency improvements for boilers, and a city-wide cap on SO_2 emissions provide effective reduction opportunities to improve local air quality with significant health benefits while simultaneously reducing GHG emissions. In addition to improving health in the city, Shanghai's CO_2 emissions would be reduced by 37 million tons in 2010 (more than a 20 percent reduction from the reference case). Shanghai city officials have incorporated results of this study into their planning and policies. During the final stages of the Shanghai IES project, the study team was commissioned by the Shanghai Municipal government to prepare a series of background reports for the air quality portion of the Shanghai Tenth Five-Year Plan.

Senior officials from the SEPB credited the Shanghai IES team for major contributions to air quality improvement measures in the Tenth Five-Year Plan. These measures included: (1) identification of fine particle control as a high priority, influencing levels of five-year goals for SO_2, NO_x and PM_{10}; and (2) identification of specific technology and fuel mix goals for the Shanghai energy system. SEPB officials also have commented that the IES work has improved the coordination among energy, environment, and public health organizations and policies of the municipal government. Officials from SEPA and CCICED made strong statements about the value of this work, including the groundbreaking efforts to assign monetary values to air pollution related health effects. Moreover, these officials view this work as a powerful model and are discussing ways to promote its replication throughout China.

The study team proposes further work in Shanghai to enhance the transparency and certainty of the Shanghai analysis. For example, no dose-response data were available specifically for Shanghai, but it also would be important to consider research to: (1) develop concentration response functions for Shanghai; (2) consider a time-series study in Zhabei District, an urban district in Shanghai to analyze the effects of air pollution on mortality; and (3) conduct a contingent value methods (CVM) study to obtain willingness-to-pay information for Shanghai specifically. Additional proposals for future work include:

- Developing an improved decision support system for air quality management in Shanghai, including air quality model improvement, and analysis of PM_{10} and O_3;
- Estimating the health benefits of mitigation options and the benefits that pollution mitigation policies may have for the ecosystem;

Table C. Average Economic Benefits of Different Scenarios with Respect to Base Case Scenario (in millions of 2000 US$)

Health Endpoint	Economic Benefits in 2010	Economic Benefits in 2020
Premature avoidable deaths	104.0-873.2	300.4-2646.0
New cases of chronic bronchitis	7.5-60.7	21.6-188.8
Cases of respiratory hospital admission	0.4-3.5	1.1-10.2
Cases of cardiovascular hospital admission	0.4-3.5	1.1-10.3
Internal-medicine outpatient visits	0.6-4.9	1.5-14.4
Pediatrics outpatient visits	0.1-0.5	0.2-1.5
Cases of acute bronchitis	0.5-4.1	1.5-12.8
Asthma attacks	0.0-0.1	0.0-0.3

• Considering other measures and options in future analysis such as the potential for economic incentives to promote environmental controls (e.g., SO_2 levy); and,
• Reevaluate the health effects from various energy options adopted in Shanghai in three to five years in order to assess the actual impact of the policies.

The study's leaders also seek to expand the area of study outside Shanghai and:

• Conduct a regional air quality study for Shanghai and surrounding provinces for SO_2, NO_x, PM_{10}, O_3, and other secondary pollutants so that transboundary and long-range pollutant transport may be investigated and included in the analysis;
• Replicate this study with similar analysis in other cities in China and undertake a national-level assessment. As part of the ongoing EPA-SEPA cooperation, a similar study is now in process for Beijing and designs for a national-level assessment are being developed;
• Expand the study topics to include more detailed energy scenarios and options, air pollutants, and water quality issues; and,
• Include the U.S. Center for Disease Control and Chinese health officials on a team to develop methodologies for health impact assessment in future Sino-U.S. projects.

Endnotes

[1] Prof. Chen Changhong of SAES led the energy, emissions, and exposure study team, assisted by Mr. Zhang Junliang, Miss Fu Qingyan, Miss Shen Hong, Miss Bao Xianhua, and Mr. Chen Minghua. Prof. Chen Bingheng of Fudan University led the health effects and economic valuation study, assisted by Prof. Hong Chuanjie, Prof. Zhu Huigang, Prof. Song Weimin, Mr. Kan Haidong and Prof. Wang Hong.

[2] Particle matter with a mass median aerodynamic diameter less than ten micrometers. PM_{10} is one of seven pollutants EPA regulates in the United States.

Call for Papers
Feature Articles and Commentaries for the Woodrow Wilson Center's *China Environment Series* Issue 6

The editor of the *China Environment Series* invites submissions for feature articles (20-25 double-spaced pages) and commentaries/notes from the field (2-4 double-spaced pages) for the 2003 issue.

I. Feature article themes of particular interest include:
• Water issues: scarcity, pollution, conflict
• Energy—Energy efficiency, policy, financing
• Green consumerism—nascent environmental protection industries, selling Green culture
• Cross-border environmental problems and cooperation—Hong Kong-Guangdong, Cross-straits, China-Russia

Authors wishing to propose feature articles focusing on other topics relating to environmental and energy issues in China or how these issues impact U.S.-China relations should not hesitate to submit a proposal.

II. For the commentaries/notes from the field section of the *China Environment Series* we welcome any topic relating to environmental or energy issues in China, Taiwan, or Hong Kong (See issues 4 and 5 for examples of previous commentaries at http://ecsp.si.edu). Commentaries based on current field research are of particular interest.

Proposal abstracts for feature articles and commentaries of not more than 250 words are due before **15 September 2002**. Please email abstracts to Jennifer Turner at chinaenv@erols.com or fax to 202-691-4184.

Authors will be given guidelines after proposals are accepted. Final drafts will be due **15 November 2002**.

Regional Integration of Hong Kong and Guangdong: Hopes and Fears

8 April 2002

Christine Loh, Civic Exchange

By Timothy Hildebrandt

Five years after the international community scrutinized the July 1997 handover of Hong Kong to the People's Republic of China the city now is comparatively ignored by the worldwide news media. Economically, while not the force of years past, the region is in good health; Hong Kong and south China weathered the Asian financial crisis without devaluing their currencies. Politically, the former colony has maintained stability; pessimistic predications of a Beijing stranglehold on the region have, as yet, not come to fruition. This relative stability in Hong Kong, with no presence of global terrorist activity and limited interests in the Enron debacle means Hong Kong is not the hot topic it was a few years ago. But, according to Christine Loh of Civic Exchange, this is no reason to ignore the region. The integration of Hong Kong and Guangdong offers an intriguing story involving interlinked political, economic, and environmental factors. This Woodrow Wilson Center meeting introduced the issue of regional integration of Hong Kong and Guangdong, highlighting environmental issues in the region and the importance of collaboration in solving problems.

Self-Determination and Economic Windfall

Politically, Hong Kong residents have accepted reality. The city-state that grew from a small fishing village to a world economic powerhouse while a member of the British Commonwealth is back under the control of its historical "birth mother," China. Economists urged China's leaders not interfere with Hong Kong's economic success and instead preserve the open door policy that has been integral to south China's economic boom. When China began to open in the late 1970s, Beijing declared south China the proving ground for a free-market economic policy in China, inviting Taiwan, Macao, and Hong Kong to invest freely in Guangdong Province. Possessing the freedom to make economic decisions themselves, Guangdong authorities have transformed their province, particularly the Pearl River Delta, into the most economically dynamic and successful area of China.

While perhaps not as romantic as Shanghai, the "Paris of the East," the Pearl River Delta is unquestionably the economic emperor of China. Interregional cooperation has been essential for Hong Kong and Guangdong's common success:

- Since the early 1980s, virtually all of Hong Kong's light manufacturing moved into southern China;
- Southern China manufacturing operations have resulted in dramatic growth for Hong Kong-based companies, along with increased value and quantity of production;
- The shift in production plants into southern China has meant Hong Kong exports fewer products than in the past. However, Hong Kong businesses now control the more lucrative end of manufacturing: production management, product design, and marketing;
- While Guangdong presently constitutes 40 percent of China's exports, Hong Kong businesses control 60 percent of Guangdong's export capability; and,
- Guangdong's per capita GDP is double that of the rest of China, while Hong Kong's GDP is over six times the size of all of China's provinces combined.

The Danger of Competition

Traditionally, Asia's economic centers (Hong Kong, Seoul, Singapore, Taipei, and Tokyo) have competed with each other. These cities often attempt to outbid each other for Olympic Games, corporate headquarters and, most recently, the new Hong Kong Disneyland theme park. (*Editor's Note: See following commentary on this topic*) Guangdong and Hong Kong, like the rest of Asia, also compete with each other. While this competition has spurred economic growth in the Pearl River Delta, it also has led to extreme cases of waste (in terms of duplicative infrastructure) and detrimental environmental impacts in the region. Clearly, as Hong Kong and Guangdong move toward economic integration, local governments on both sides of the border need to contend with similar "side effects" of development and pollution problems—as Loh noted, environmental issues "respect no political

borders."

Uncontrolled Development

Looking at transportation networks, Ms. Loh reported that the Pearl River Delta is home to five fairly major airports—two of which are "hardly doing anything at all." For regional integration that is economically *and* ecologically sound, Hong Kong and Guangdong must avoid such waste and environmental destruction. Loh suggested a regional "spatial database" be created in order to identify areas that are suitable for development—and those that simply should not be touched. The key, according to Loh, is cooperation among policymakers on regional development planning. While scholars and scientists in the region understand responsible development, it will be a challenge to raise such awareness among city, county, and provincial government leaders.

Christine Loh

As the region continues its rapid growth, observers hope the Pearl River Delta will not commit the developmental sins of Hong Kong. Christine Loh, however, fears the Pearl River Delta is on track to repeat Hong Kong's failure to adopt a conservation policy. She envisions the push for economic growth through massive infrastructure projects will lead to less conservation and more irresponsible development in Guangdong. Ms. Loh provided one telling example: Guangdong government officials have issued plans to construct the "Guangdong-Hong Kong-Macau (GHM) Major Bridge," to connect the eastern side of the Pearl River Delta to the west. A capstone of the project would be the Macao Immigration Check Point. This development would necessitate a vast reclamation project to create enough land for the checkpoint and a massive housing project—the latter would be developed to provide financing for the bridge. Massive infrastructure initiatives like the Delta Bridge and Hong Kong Disneyland have incurred a high financial cost and, according to Loh, a high ecological one as well. Loh lamented the public indifference in Hong Kong to the "deletion" of an entire bay for the theme park construction, a stark contrast to a similar situation in the United States. "I know that people in Virginia are very proud of themselves because they rejected Disney. This does not happen in our part of the world. People see these [large infrastructure projects] as ways to generate economic returns."

Insufficient Infrastructure, Inadequate Information

Responsible development is, according to Loh, dependent upon reliable information making its way to the policymakers who are in a position to affect change. These individuals in Hong Kong and Guangdong, however, have yet to receive a comprehensive picture to create environmentally friendly development policy for the whole region. Clear data on the long-term costs of inefficient development and environmental degradation will be needed to convince policymakers on both sides of the border to commit politically and financially to regional development research and planning. One current obstacle is that data is difficult to access in Guangdong, as many local governments are only willing to sell such information.

There is a great need for adequate water and solid waste processing investment and planning in the region. Despite being a developed city on par with Toyko and Sinagpore, Hong Kong still suffers from inadequate infrastructure for wastewater and solid waste disposal. Loh declared that Victoria Harbor is "*still* half a cesspit [after] many years [being treated as] a public toilet." In some areas of Guangdong, wastewater lacks advanced treatment while solid and hazardous waste disposal facilities are often nonexistent.

Public Awareness Factor

The general population in Hong Kong grossly neglects environmental problems. Environmental issues that do capture public attention are approached from a shortsighted perspective. For instance, with the growing energy shortages in Hong Kong residents care only about avoiding brownouts, not the larger, more sophisticated problems such as carbon loading, energy-efficient buildings, and renewable energy. Loh insists a change in the environmental mindset of the region must be made to improve the ecological situation of the Pearl River Delta. Loh's think tank Civic Exchange has partnered with a Shenzhen academic institution to conduct a study examining people's attitudes in the Pearl River Delta

toward the environment and what efforts they as individuals make to promote environmental protection in their area.

Public awareness is also low, Loh contends, due to the lack in Hong Kong and Guangdong of enough environmental "champions" to affect large-scale change. The well-known personalities that champion other causes in the region have yet to attach themselves to ecological issues (except, perhaps, Loh herself). The most influential, well-known people in the region—many in business—are fixed in the mindset of competition within the Pearl River Delta rather than collaboration on sustainable development.

Financing

Perhaps the biggest roadblock to solving environmental problems in Hong Kong and Guangdong is a lack of funding. Options for the region are constrained by preferences for continued economic autonomy and its great wealth—accepting money from the Chinese government would implicitly obligate Hong Kong and Guangdong to follow Beijing's directions, while multinational lending organizations like the World Bank and Asian Development Bank would not chose to operate in such a rich area. This leaves the Pearl River Delta with only two viable options for funding—private money and regional government support. Private funding of public projects is not uncommon in the region. Hong Kong-based investors already own a big chunk of infrastructure on both sides of the border—the Zhejiang expressway in eastern China is listed on the Hong Kong stock exchange. Few private groups, however, are willing to fund the ugly "underbelly" of city infrastructure like wastewater treatment. Government funding can be equally difficult to secure for these less appealing projects. The necessary infrastructure projects, integral for the ecological health of the region, thus lose out to the grander, more profitable, often environmentally detrimental schemes.

ENVIRONMENTAL MOVEMENTS AND REGIONAL COOPERATION

According to Loh, environmental movements in the Pearl River Delta region are "few and far between." One significant problem for nongovernmental organizations (NGOs)—especially within Mainland China—is a lack of expertise. Too often green groups do not possess the necessary scientific knowledge to accompany their advocacy work, making themselves vulnerable to criticism. The burden of proof lies on the green NGOs, which means that scientific expertise and intellectual capacity are crucial for the survival of south China's environmental movements. Regional environmental work among NGOs also is complicated by the difficulty of self-organization on the mainland. Ms. Loh noted, however, that since environmental protection is relatively non-political compared to contentious issues like constitutional reform and human rights, the Chinese government has allowed for the development of green groups.

While the number of green NGOs is still small in mainland and Hong Kong, environmental research is strong within universities and research centers on both sides of the border. Consequently, some intra-regional ecological work is underway. Air quality research and monitoring provide particularly promising areas for collaboration. While the Hong Kong and Guangdong governments jointly embarked on a groundbreaking study on air pollution, university-supported environmental research is even more prolific. For example, in Hong Kong the University of Science and Technology and Polytechnic University have collaborated with Beijing University and the Guangdong government on an air quality study. Georgia Tech has done significant work on ground-level ozone in Guangdong as well. More recently, Civic Exchange has initiated research on regional environmental issues by bringing together a research team to propose innovative management and financing options for water and wastewater infrastructure in the Pearl River Delta. The team will produce a report in summer 2002. This collaboration of academics and practitioners is integral, according to Loh, for the successful application of environmental research in the policy sector.

THE PROMISE OF COOPERATION

The growing economic, social, and political integration between Hong Kong and Guangdong offers a unique opportunity to address shared infrastructure and environmental problems throughout the Pearl River Delta. To more effectively solve the area's troubles, Christine Loh suggests that residents must change their mindset from one that is city-centered, stressing intra-regional competition (Hong Kong versus Guangdong) to one that is region-centered, focusing on unified efforts within the Pearl River Delta.

Hong Kong and Guangdong have the luxury of an "executive-led" government. Once the governments have resolved to embark on a project, the process is completed *post haste*. While this can easily result in irresponsible infrastructure projects, it could just as easily benefit ecologically sound development activities and conservation projects. Ms. Loh recounted one fast acting Hong Kong government move to concrete the slopes around the island to prevent destructive landslides during

rainstorms. Though happy with the protection provided by the project, residents complained of the unsightly concrete slopes—just as quickly as the original concreting was complete, the government had beautified the slopes with new vegetation.

Christine Loh reminded the audience of the admiration held for the Pearl River Delta's beauty, " I was with a Chinese official in Shanghai…and he said to me, 'You know, you're so lucky in Hong Kong. We have the water, but you have the mountain and the water.' I came home and I thought I better go up to the peak and have a look. And my god, Hong Kong is beautiful." "But," Loh continued, "we do stupid things. We go…fill in the harbor and ruin the skyline…we do silly things." A history of unchecked development and a ceaselessly competitive attitude makes ecologically responsible regional integration in Hong Kong and Guangdong a daunting task. While "silly" decisions have degraded the environmental health of the region, residents like Christine Loh have resolved to make a change for the better.

This Wilson Center meeting was cosponsored by ECSP's China Environment Forum and The Asia Program.

Commentary: A Wonderful World of Disney? The Environmental Implications of the Hong Kong Theme Park Construction

By Timothy Hildebrandt

Flanked by Mickey Mouse on one side and his life partner, Minnie, on the other, Tung Chee Hwa announced on 2 November 1999 an agreement to build the Walt Disney Company's third theme park outside of the United States in Hong Kong. Chief Executive Tung insisted the nearly $4 billion deal was evidence of Hong Kong's resiliency, proof positive that the cosmopolitan Special Administrative Region (SAR) could overcome a slow economy and political uncertainties. November second was the climax to a lengthy competition among Asian economic powers to secure the theme park. Hong Kong's bid successfully beat out Shanghai, South Korea, Taiwan, Singapore, and Subic Bay in the Philippines. The competition was heated for the Disney theme park; a project viewed by Asian governments and investors as an automatic economic windfall and guaranteed tourist attraction, which could stimulate the flagging tourist industries in Asia.

An Unequal Treaty?

Some contend the big winner is not Hong Kong but the Walt Disney Company. At $3.6 billion, the theme park will be the biggest spending commitment from the government since the 1997 construction of the ultramodern Chep Lap Kok airport. Hong Kong will bear 88 percent of the park's construction costs (including land, transportation, and loans) but will receive only 57 percent of the park's equity. Disney contributes 12 percent of the initial costs, while enjoying 43 percent of the equity on top of a management fee. Many observers have cried foul. Christine Loh—a former legislator and currently CEO of the public policy think tank Civic Exchange—noted, "This deal is being presented as a fait accompli in the most flashy way to pump up the public-relations value. By the time we get the numbers, people will already have been given the impression it is a great deal."

While this expensive plan is a risk—an estimated 80 percent of the theme parks built in China over the last five years have since closed—the Hong Kong government is quick to rationalize the high cost. Officials contend 16,000 jobs will be created in the first phase of construction, with 35,800 within 20 years; $1 billion in first year annual revenue is expected to double annually over the next 20 years. While the investment may generate revenue and employment in Hong Kong, environmentalists contend that the region's environment is shouldering an even higher cost than the burden on government coffers. A central issue is the pollution of nearby waters, which is affecting fish populations and the citizens whose livelihood rests on the fishing industry.

Environmental Concerns

"Hong Kong Disneyland," as it will be officially known, is being constructed on 311 acres of reclaimed land at Penny's Bay, an inlet on Lantau Island, famous for the new Hong Kong airport and the world's

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largest sitting bronze Buddha. The intense dredging to create more land for the park began in 1999 and this land reclamation has raised concern among the area's local fish farmers, who claim:

- Since dredging began some fish, like groupers, have stopped spawning, while other species, such as red crabs and flower crabs, have simply disappeared;
- Prior to dredging, local fishers would haul 130 pounds of catch a day, whereas they are now lucky to net 33 pounds;
- Fish stocks have dropped 80 percent since 1999; and,
- The reduction in food stocks by the dredging have led to fears that the endangered Chinese white dolphin will at best move from the area, at worst dwindle in numbers.

The economic effects of environmental degradation are also of grave concern:

- Local fishing industry sources estimate $4 million losses in 2001 alone; and,
- The number of fishing families has fallen from 70 prior to the reclamation project to 30 today.

A local fisherman, frustrated with the situation, declared, "Polluted waters from the Pearl River Delta reduced fish stocks in the last few years, but Disney was the last straw." The largely uneducated, illiterate fishing families fear there are no employment opportunities outside of fish farming.

In addition to anxiety over the impact of recent land reclamation, future phases of the project also raise concerns over potential environmental degradation. A particularly troubling problem lies at the former Cheoy Lee Shipyard. Decommissioned in 2001 to ease in the movement of construction infrastructure near Penny's Bay, the shipyard poses a logistical headache to government officials and an environmental nightmare to observers. Dismantling the yard to make room for Disneyland will involve the movement of 87,000 cubic meters of contaminated soil, 42,100 cubic meters of soil and rock, and a massive decontamination effort. Consultants have warned that this phase of the Disney park construction will "cause high level impacts on ecological resources." Rice-fish habitats and plant species potentially will suffer the most from the soil contaminating the bay waters.

Government Reaction

The Hong Kong government insists that some of the environmental claims made in public are misleading and/or false. Addressing the Chinese white dolphin issue, government officials claim the construction is environmentally sound and the waters near the reclamation area are not "highly utilized" by the species and thus are not under a serious risk. Despite their insistence of minimal environmental degradation from the Disney park construction, government civil engineers admit that some problems are expected: "To some extent, the water quality will be affected." Officials insist, however, that every effort will be employed to minimize the impact:

- A 2-mile long silt curtain and a 200-yard barrier of rocks have been installed in Penny's Bay in an effort to keep contaminants out of surrounding waters; and,
- Artificial reefs will be constructed after park construction is complete in hopes of luring back native fish species.

In a further indication that government officials quietly own up to the environmental problems associated with Hong Kong Disneyland, 1,144 fish farmers have received funds in exchange for a promise to move their fishing elsewhere. From the beginning of reclamation until January 2001, the Hong Kong government had already distributed $38.5 million in compensation for farmers who gave up their livelihood.

Disney Reaction

With such intimate government involvement in the theme park construction, the Walt Disney Company has the luxury of avoiding much discussion of environmental concerns associated with the project. When

asked for reaction, Disney officials generally reiterate the government's role in the construction, insisting that reclamation (and, seemingly, all problems associated with it) is solely the responsibility of the Hong Kong government. That being stated, Disney still contends that the project is eco-friendly, "To date there's no evidence that links the current issues that the fishermen are saying to the reclamation at Penny's Bay."

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References

Cordingley, Peter. (1999). "Donald and Mickey." *Asiaweek*, (March 12).
"Fantasyland." (1999). *The Economist*, (November 6), 67.
"Hong Kong fishermen protest dredging operations." (2001). *Reuters*, (January 11).
"Hong Kong gives Disneyland environmental OK." (2000). *ENN* (March 13)
Official government Disney site http://www.info.gov.hk/disneyland/indexe.htm
Vidaillet, Tamora. (2000). "Pollution threatens Hong Kong's rare pink dolphin." *ENN*, (December 29).

The Asia Program at the Woodrow Wilson Center

Scholars under Siege? Academic and Media Freedom in China

Beijing's detention of several overseas Chinese scholars for spying has aroused renewed concern about academic and media freedom in China and the personal security of foreign scholars working in the PRC. Where are the lines in China separating "spying" from legitimate scholarly inquiry and media coverage?

At an October 2001 seminar titled "Academic and Media Freedom in China" sponsored by the Asia Program, four speakers explored the constraints under which scholars and journalists operate in China. Speakers agreed that Chinese intellectuals have gained a certain degree of freedom in academic discussion and media reportage, but cannot challenge official ideology in public discourse or through regular media. Perry Link of Princeton University attributes the ingrained habit of self-censorship among academics and journalists to Beijing's psychological control system, which he characterized as resembling a giant anaconda coiled in a chandelier overhead. A full report on this meeting is available at: http://wwics.si.edu/asia/support/asiarpt_102.pdf

China's "Credibility Gap": Public Opinion and Instability in China

To what extent must China's leadership take public opinion into account in making policy? While it is difficult to measure, there appears to be a growing gap between public opinion and government policies in China. Understanding the magnitude of this gap will be crucial for the government to know whether it has lost the support of the populace. The last decade has seen an increase in new channels for the expression of public opinion, but the importance public opinion will play in Chinese politics remains uncertain.

An Asia Program seminar on public opinion and instability in China on 6 March 2002 featured four experts on Chinese politics who examined public opinion in China, and its implications for China's social stability. One of the common themes of the presentations was the role of rampant corruption and growing economic inequality as engines of increasing discontent within the Chinese populace. The future survival of the current authoritarian regime in China, while ultimately uncertain, may be contingent upon how the government embraces public opinion and undertakes the necessary reforms to address the people's concerns.

For more information on these or other Asia Program China meetings and publications
E-mail asia@wwics.si.edu or call 202-691-4020.

Crouching Suspicions, Hidden Potential: U.S. Environmental and Energy Cooperation with China

By Pamela Baldinger and Jennifer L. Turner

This special publication, published June 2002, provides a succinct summary of U.S.-China cooperation in the areas of energy and environmental protection. The authors highlight the current barriers to such cooperation, as well as explore how and why U.S. policymakers and nongovernmental organizations should have a keen interest in the energy and environmental policies China adopts, given the potential impact of these policies on the United States and the rest of the world.

Executive Summary

Perhaps no country besides the United States will have greater impact on global energy and environmental strategies in the coming years than the People's Republic of China (PRC). The world's most populous nation already consumes more energy and emits more greenhouse gases than any country except the United States, and may surpass the United States in both categories within two to three decades. If China maintains economic growth rates of 5 to 7 percent per year its economy will increase three- to five-fold by 2025—with enormous consequences for the rest of the world. Chinese experts predict that China's ability to meet energy demand from domestic sources will fall short by approximately 8 percent in 2010 and 24 percent in 2040—the resulting increased demand for energy imports could result in higher global energy prices. Moreover, China's breakneck pace of modernization already has left it with nine of the world's ten most polluted cities and its sulfur emissions have led to acid rain throughout Northeast Asia. Even countries halfway around the globe are feeling the impact of China's pollution problems and inefficient use of natural resources.

Despite these alarming trends and the growing role China undoubtedly will play in shaping future global energy markets and environmental trends, energy and environmental issues have not occupied a prominent position in U.S.-China relations. To the extent that energy and environmental issues have been considered at all, U.S. policy regarding cooperation with China in these areas has not been sustained or consistent, reflecting tensions in the U.S.-China relationship, disagreements between past administrations and Congress, and the higher priorities given to other issues in the relationship. The perceived incoherence of U.S. policy has not served well U.S. firms and citizens, the people of China, and key allies in the strategic East Asian region.

This paper explores the opportunities and challenges for the United States to develop a coherent approach to energy and environmental relations with China. This exploration begins with an overview of China's impact on global energy markets and environmental quality. In addition to a discussion of the scope and challenges to Sino-U.S. environmental and energy cooperation, the paper also includes an in-depth discussion of commercial opportunities and challenges for U.S. environmental technology and energy efficiency companies. The conclusion highlights some of the advantages Sino-U.S. energy and environmental cooperation could offer both countries.

Specifically, the authors argue that strengthening Sino-U.S. governmental energy and environmental cooperation could promote collaboration on environmental agreements at the international level, bolster opportunities for U.S. energy and environmental technology firms, and help prevent U.S. isolation from the rest of the international community on environmental issues. Greater bilateral cooperation and information sharing on common environmental and energy problems not only improves bilateral governmental relations, but also could facilitate environmental and energy collaboration among NGOs, research centers, and news organizations in the United States and China. Such networks could better highlight the extent of U.S.-China economic and ecological ties. Cooperation on common environmental and energy challenges also could build confidence in the overall Sino-U.S. relationship and enable the two countries to work together on other pressing issues.

To obtain a copy of this publication contact Jennifer L. Turner at chinaenv@erols.com or 202-691-4233.