COMMENTARY

Citizens Finding a Voice: Bottom-up Politics in China's Nuclear Power Debate

By Xiang Fang

Citizens have not often had a great voice in shaping policies and development decisions in China, but over the past twenty years there has been some political space opening for individuals and environmental nongovernmental organizations (NGO). Much has been written on China's emerging green NGO sector and the growing number of citizen protests over pollution impacting their communities, such as the highly publicized mass protest of citizens in Xiamen city that halted the planned construction of a chemical plant in a residential community. Less studied is the relatively new phenomenon of citizens reaching out to local legislative representatives to express discontent over development projects that they perceive as harmful to the environment and human health. One documented example, was the case of provincial People's Congress deputies stepping in to a debate on the Sihui industrial park pollution in Guangdong Province. [Editor's Note: See CES 9 Feature on Guangdong]. Such involvement of People's Congress deputies offers a potentially effective new model of public engagement in environmental policymaking. Specifically, pollution victims could potentially use People's Congress deputies at the national, provincial, and/or county levels to put forward proposals to suspend construction of polluting companies or even to demand compensation for pollution victims (Shi & Zhang, 2006).

Some researchers have observed that members of the Local People' Congresses in China are becoming increasingly active in environmental issues (Lo & Leung 2000), which is an emerging trend I opted to examine in my own dissertation work. As part of my research, I explored a case of bottom-up pressure by Chinese citizens and their People's Congress deputies against the planned construction of an inland nuclear power station in Dapu Townland in Guangdong Province.

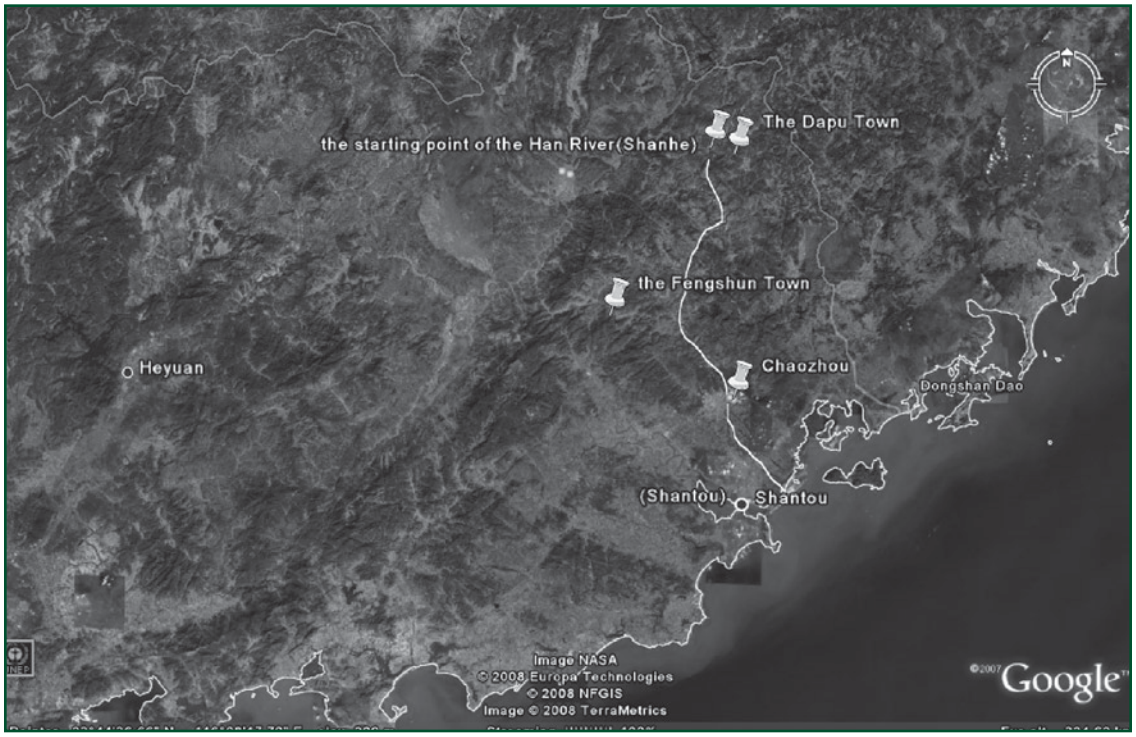
NUCLEAR POWER PRIORITIES

China currently has 11 nuclear power plants that supply 2.3 percent of the country's energy.[1] In 2007, the National Development and Reform Commission (NDRC) stated that China will construct 30 nuclear power plants by 2020 to help lessen dependence on coal (NDRC, 2007). Notably, China's energy demand is growing so fast that even if completed these nuclear power plants will provide only 4 percent of the country's energy supply (Shen, 2005). To begin reaching this nuclear power goal, in 2005 the NDRC announced plans to set up inland nuclear power stations as part of the Twelfth Five-Year Program, which means construction of these stations will start in earnest in 2012 (NDRC, 2007). Chinese provinces already have started to inspect potential locations along main rivers,[2] in compete effectively for central government investment into inland nuclear power projects that will be part of this new five-year program. Guangdong Province has been most aggressive in proposing such plants, for while the province has 2 nuclear power plants that supply 6.5 percent of the province's energy, it needs more. Guangdong lacks coal and oil resources and thus has faced big challenges in securing steady energy supplies.

On April 2007, Guangdong provincial authorities announced the potential sites for the inland nuclear power station on the upper reaches of the Han River (inside Dapu Township), a less-industrialized area in southeastern Guangdong that is targeted for development. News of the project provoked uproar from local people, which prompted the People's

Map 1. From Google Earth with markings by author

Map 2. From Google Earth with markings by author



Chaozhou City at the headwaters of the Han River.
Photo Credit: Xiang Fang

Deputies in Shantou and Chaozhou cities to take the unusual step of asking for an inquiry meeting to address the issue. This is the first time that civil nuclear power development in mainland China has provoked negative media coverage and opened up a public debate. In order to investigate this controversy, I spent two months conducting an ethnographic style case study in three cities (Meizhou, Chaozhou, and Shantou) in eastern Guangdong. From June to August of 2007, I explored local perspectives on the inland nuclear power station in the upper reaches of the Han River. My goal was to investigate the reactions of citizens and the local officials to the potential inland nuclear power project. This case not only examines the role People's Deputies took in advocating for their citizens, but it also reveals the growing willingness of Chinese citizens to voice their concerns about the risks of civil nuclear power.

INITIATION OF THE INLAND NUCLEAR POWER PROJECT IN THE HAN RIVER

The Han River is located in Guangdong Province and is the source of drinking water for over 10 million people living in South East Guangdong. (See Map 1). East Guangdong is the breadbasket of the province, producing mainly rice and cash crops. The Han River is a large river that today adequately supplies water for agriculture, industry, and major cities in the basin—a rarity in much of China. According to the Shantou City Environmental Protection Bureau's weekly online water quality reports, the drinking water quality of the Han River is very good Grade II rating. Provincial government and municipalities along the Han River have enforced water protection regulations and plans that have helped maintain this high water quality. Local governments and citizens in Shantou city are very serious about protecting of the river since it is the only unpolluted river in the city. When I visited the automatic water monitoring station in Shantou city I discovered that it had been publicizing its daily reports of Han River quality since October 2003.

Since 2006, scientists and experts from the Guangdong Development and Reform Commission, Guangdong Nuclear Power Group, and China Nuclear Power Cooperation started to test the potential for building an inland nuclear power station in the upper reaches of the Han River. They identified three potential locations in Dapu and Fengshan counties (see Map II), which exhibited excellent/satisfactory geological conditions. According to local

BOX 1. **Sceptical People's Deputies**

Below are some of the comments made by Shantou and Chanzhou People's Deputies to Provincial People's Congress on 4 February 2004 in an inquiry about building nuclear power plant along the Han River (Chen, 2007).

There are Daya Bay, Lingao and Yangjiang nuclear power stations which have been built up or being built up inside Guangdong Province. We have very long costal line inside the province. Why is the province still planning to build inland nuclear power stations? Why pick up the Dapu and Fengshun town district in Meizhou City district? May I have officers from the Development and Reform Commission of Guangdong Province explain this? —Chen Han Chu PD from Shantou City

The Han River is not the Daya Bay. It is our mother river. Over 10,000,000 people living in the middle and lower reaches of the Han River depend on it for drinking water. I asked the question on behalf of these 10,000,000 people: if (they are) really going to build the nuclear power station in the upper reaches, will there be any pollution on the water? —Liang Yinying PD from Chaozhou City

I studied biology before. The temperature of this cooling water can get up to 310 degrees. There must be bad influence to aquatic creatures in the river! —Chen Shaohe pearl growing expert and PD from Shantou City

officials I interviewed, over one hundred scientists and experts participated in the exploratory studies in the counties over the past two years. If the project is confirmed, it would be the third civil nuclear power base inside Guangdong Province, apart from the Daya Bay (Shenzhen City) and the Yangjiang (Yangjiang City) nuclear power base.

ATTITUDES ABOUT THE NUCLEAR POWER PROJECT IN THE DOWNSTREAM

My fieldwork research, which included interviews with local citizens and officials and information from newspapers and online forums, revealed that people who live in the lower reaches of the Han River base are broadly opposed to the nuclear power project. Local people are concerned that the power station may pollute the drinking water resources. After reading the news about the planned nuclear power project in the *Meizhou Daily News* in early September 2006, some people in Shantou and Chaozhou cities wrote to the city council to inquire about the project. People's Deputies (PDs) also received inquires and complaints about the project. Mr. Chen Han Chu a provincial PD in Shantou City organized other PDs in the city to discuss this issue on 6 December 2006 at the Shantou City People's Congress. Mr. Chen informed me in an interview that some of the city PDs had scientific knowledge in this area and included Professor Gao Kun Shan the director of Ocean Biological Research Centre of Shantou University and Professor Chen Xu Shen from the Physics Department of Shantou University. After the meeting, PDs expressed their concerns and questions about the possible environmental health problems of the nuclear power plant at the Fifth Conference of the Tenth Provincial People's Congress on 4 February 2007. After the conference Mr. Chen also wrote a letter to summarize their suggestions for the province leaders. An edited translated of their comments and questions included the following (*Shantou Social and Science Journal* 2007.3):

(1) The Han River is the mother river of Shantou, Chaozhou, and Meizhou cities. A nuclear leakage would have catastrophic results, for it would not only pollute the ocean, but also the Han River Basin, putting the lives of the ten million people who depend on it for drinking water in danger. When reference is made to other countries' experiences with nuclear power operation; nuclear power is not 100 percent safe. To date there have been several serious nuclear accidents

in Western countries. Additionally, scientists and experts do not have very strong evidence to show that there are no risks from nuclear reactor operations, and they cannot guarantee there will not be any invisible pollution of the river which could have consequences for the later generations of inhabitants.

(2) It was reported that the capability of the reactor will be up to 1,000 MW. How much cooling water is needed to support this nuclear reactor? How much is the current capability of the Han River to supply this cooling water in the winter and dry seasons? Could the nuclear power plant create "warm pollution" that damages fish and other aquatic creatures? If the temperature rises, bacteria and microbes will increase, potentially turning the river into a dead river.

(3) There are concerns regarding the safety of shipping the building materials as well as radiation materials and waste. Shipping those materials to the upper reaches of the Han River will be expensive and will also create the risk of water pollution. Considering this issue, we suggest that it might be better to build the nuclear power plant along the Guangdong's long coastline where any accidents might inflict lower damanges and costs.

(4) The Han River is the best drinking water resource and fish producer in the province. We do not accept putting this excellent river in Guangdong Province at risk of pollution. Such pollution would violate the requirements in the newly issued *Guangdong Drinking Water Resource Protection Regulations.*

(5) Recently the economic development of east Guangdong has seen a period of downturn. The provincial government's plan has policies to improve economic performance in east Guangdong and we are concerned that the nuclear power station will have a negative influence on the investment environment of Shantou and Chaozhou cities.

Apart from these comments and suggestions, Mr Chen Han Chu and the other PDs in Shantou and Chaozhou cities also asked for an inquiry meeting in the Provincial People's Congress on 4 February 2007. The PDs used this meeting to express their anxieties about the nuclear power project. This meeting was surprisingly transparent, with some of the questions the PDs being reported in the *Southern Daily*. (See Box 1).

REPLY FROM THE PROVINCIAL COUNCIL

Replies from officers and experts at the inquiry meeting in the Provincial People's Congress on 4 February 2007 responded to concerns but indicated support for continuing the planning:

1. The inland nuclear power station is just at the preliminary testing stage. The project will start in 2012.
2. Regional and central governments are taking the safety and environmental impact of nuclear power plants very seriously. Once the government has approved this project there will be agencies to guarantee its safety and manage and monitor the pollution risk. It is certain that a Chernobyl-style accident will not happen in China.
3. The regional and central government will seriously consider people's opinions on civil nuclear power projects.

Support for the project appeared to be waning, when four months later in June of 2007, PDs in Shantou city received a reply letter from the Guangdong Development and Reform Administration, stating that the province did not plan to build any nuclear power stations on the upper reaches of the main rivers inside Guangdong Province before 2015. Until that time, the province's nuclear power plan will continue to concentrate on the coastline. Because so much of the debate on such development issues it is difficult to know definitively if the Shantou PDs did shape the decision to postpone the planning, but citizens who were against the nuclear power plant most likely saw the postponement as their success.

PONDERING THE POTENTIAL OF BOTTOM-UP POWER IN NUCLEAR ENERGY DEVELOPMENT

While People's Congresses in China have often been considered rubber stamp organizations, at the local level PDs are potentially evolving into a means for citizens to express concerns about new policies and investments. According to the law of China, deputies to county and township People's Congresses are directly elected. Deputies to the People's Congress above the county level are elected by deputies at lower levels. National People's Congress deputies are supervised by delegates at lower levels, but PDs at all levels are ultimately re-

sponsible to the people, who can recall them. PDs can raise motion (*yian*) to formally discuss a broad range of issues when the People's Congress is in session. Alternately, they also have the right to raise a suggestion (*jianiyi*) at anytime, which is becoming a casual way for PDs to give suggestions, critiques, and opinions to government agencies at their own level or below or to communicate with People's Congress at the higher level. In the Han River case, PDs from Shantou and Chaozhou city responded to public demands and asked for the inquiry meeting and wrote letters to the provincial government to represent their disagreement with the nuclear power project.

According to my research findings, the case in Guangdong demonstrates that bottom-up policies led to the successful resistance of the nuclear power project in the upper-reaches of the Han River. A citizen protest against such a development project could very well have been suppressed because the project would be viewed as a central government priority. Citizens instead used the PDs to help them ask questions about this major civil nuclear power project. Guangdong thus provides a clear example from which other provinces have the opportunity to learn. Although PDs played an important role in expressing the concerns of citizens in the Han River case, dependence on the PDs to resist or oversee the location of nuclear power projects is not enough. Ultimately China needs NGOs that have the ability to become involved in the nuclear power debate to promote transparency and public participation (Wen, 2007). Notably, citizens in Guangdong did self organize in lobbying their PDs, through online forums and letters. However, for the public to engage further in the policymaking process of civil nuclear power projects in the China, NGOs represent an important mechanism that could be used to supplement PDs.

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NOTES

1. World Nuclear Association. "Nuclear Power in China" [Online]. Available. http://www.world-nuclear.org/info/inf63.html

2. Nuclear power stations need huge amount of cooling-water from rivers or seas. That is why inland nuclear power stations have to be built by the side of major rivers.

SPOTLIGHT

A Wake-Up Call to Polluting Companies

By Christine Boyle & Jing Chen

It is a crisp Beijing morning in February 2008, and the phone at the Institute for Public and Environmental Affairs (IPE) office will not stop ringing. A Hong Kong-based businessman has read in the morning paper that his company is listed as an environmental offender in China. A public relations representative of an American company reports that he has heard from concerned stockholders that their company sources products from several "listed" environmental polluters in China. A well known soft drink company official calls to inquire as to how her company could be "listed" as violating China's environmental laws when the company follows a strict code of sustainable business practices. It is a typical day on the phones for IPE staff following the posting of the latest government-released data on factories committing environmental infractions on IPE's online Pollution Map of China (www.ipe.org.cn).

The Pollution Map of China is an online tool that IPE developed to display pollution violation records that took place over the past four years (2004-2008). To date, the map's database contains the names of more than 32,000 companies that have been cited by China's environmental protection bureaus for violating air and water pollution standards As the Chinese government pushes for more information transparency—such as the 2008 *Environmental Information Disclosure Measures*—and greater engagement of the public in environmental decision-making, the number of companies cited for violations, as well as detailed data on their discharges, are expected only to increase.

> **"The China Pollution Map…underscores how public accountability could become a new tool in tackling China's environmental pollution."**

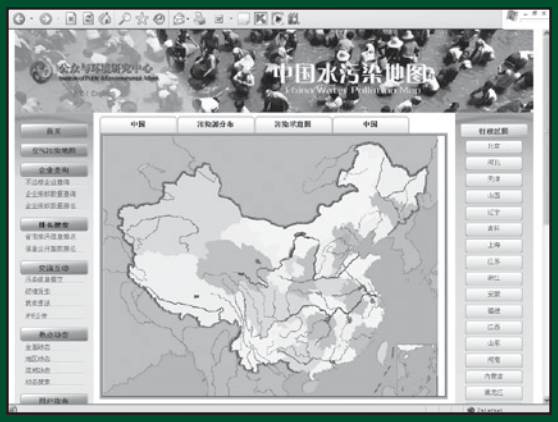
With many international companies headquartered far from polluting activities in China, corporate executives previously were unaware of the environmental damages inflicted by their manufacturers and suppliers. With the widespread publicity and utilization of IPE's China Pollution Map, publicly available data on the environmental infractions of manufacturers throughout China are accessible to the public and to companies for addressing pollution within their supply chains.

The China Pollution Map is recognized globally by environmental groups, the media, and international companies for its novel and effective approach of combining information disclosure and civil society participation to improve environmental performance in China.

BLAZING A NEW PATH FOR ENVIRONMENTAL PROTECTION IN CHINA

The China Pollution Map has been successful in raising awareness of the magnitude of pollution problems and underscores how public accountability could become a new tool in tackling China's environmental pollution. However, while the China Pollution Map publicizes environmental infractions, publicity alone does not provide a proactive solution for companies looking to clean up their supply chains. The next step in addressing industrial pollution needs to integrate accountability into

The China Pollution Map



supply-chain management by making both buyers and suppliers responsible for how manufacturers treat the environment. In August 2008 at a gathering of CEOS at a Green Olympics Forum in Beijing, Ma Jun, IPE's founder and executive director, announced his NGO's next step in promoting responsible supply-chain management—the Green Choice Alliance for Responsible Supply Chain Management Program. This program aims to curb environmental pollution in China's manufacturing hubs by integrating transparency and stakeholder participation into existing supply-chain management systems. Following the meeting, CEOs approached Ma Jun in wonder at the ingenuity of the program, and also to comment that no other civil society organization in the world is systematically tracking regional pollution infractions in order to hold corporations accountable.

Green Choice (GC) Alliance uses the constantly updated IPE database to assist corporate citizens in monitoring the environmental compliance records of their suppliers. The GC Alliance principles aim to hold corporations accountable for the environmental performance of their supply chain partners in China in a practical, verifiable, and transparent way. Membership in this alliance is open to corporations that buy or produce products in China and NGOs in China that serve as external monitors for auditing and verification of factories' environmental compliance. IPE requires each member company involved in the GC Alliance to do the following:

- Commit to reject products or services provided by a supplier identified as a violator of environmental rules and standards in China and is verified as being unwilling or incapable of taking actions to achieve compliance with relevant environmental regulations;
- Draft an Action Plan illustrating how the company will meet the requirements to use the GC Violators Database and utilize the market-based GC Audit as a tool to verify results of remediation efforts made by government-listed violators;
- Use only accredited GC auditing companies; and,
- Mandate Chinese NGO participation in the GC Audit process to ensure external validity and enhance transparency (the NGO participants are members of the GC Alliance and have completed requisite training courses prior to attending GC Audits).

THE CHALLENGES OF MANAGING GLOBAL SUPPLY-CHAIN PERFORMANCE

In recent years, multinational corporations (MNCs) have found that poor business practices overseas have long-standing impacts on their brands. Public scandals regarding labor rights, such as the ones faced by some major apparel brands, have proved to MNCs that contracting production to another legal entity does not absolve a brand name from responsibility over production of its products. In response to calls from shareholders and customers, MNCs have begun integrating corporate social responsibility (CSR) into their business operations to meet growing demands for environmentally responsible product sourcing, similar to strategies addressing labor issues a decade ago. However, despite MNCs strong public statements, environmental management remains a weak link in extending CSR to supply chains, due to the technological complexity of environmental performance monitoring. Such monitoring is particularly difficult in China where the manufacturing sector is made up of many small companies that often change names and location and transactions are often made in cash.

A CALL TO ACTION

This opportunity for responsible corporate citizens to proactively green their supply chains has prompted two of the world's largest retailers to join GC Alliance as the first two corporate members. On 22 October 2008, Ma Jun participated in Wal-Mart's Sustainability Summit in Beijing where

Wal-Mart CEO Lee Scott announced to over 500 suppliers a business strategy that matches IPE's fundamental principle for MNCs: "Wal-Mart will no longer do business with suppliers that are unwilling to comply with basic environmental laws of China." This initial commitment is not only important to build the GC Alliance and implement processes for building green supply chains, but also to level the playing field for all manufacturers in China.

Pressures to maintain low prices, meet buyers' quality standards, and produce adequate quantities have led some suppliers to cut corners on environmental protection. Suppliers are rightfully concerned that they cannot remain competitive if they make large capital investments into cleaner technologies such as water purification, scrubbers, industrial wastewater treatment, and other waste processing equipment. The commitment to common sourcing practices developed by GC Alliance member companies may raise the bar so that suppliers compete above the baseline requirements of legal compliance.

The GC Audit of alliance members is different from the usual supply-chain audit because it requires the audit be done by professional institutions under the supervision of local Chinese NGOs. Requiring professional institutions to conduct the GC Audit means to ensure the professional capacity of auditors. The participation of local NGOs aims to ensure the impartiality of the process and build the capacity of Chinese environmental groups. The transparency and NGO participation aims to minimize conflicts of interest by the auditor. To date IDE's Green Choice Audit mechanism has a proven track record of over 14 successful cases with leading multinational companies.

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COMMENTARY

Provincial Impacts of Multilateral Cooperation: The Greater Tumen Initiative and Environmental Protection in Jilin

By See-Won Byun

Plagued by political tensions within a complex security environment, Northeast Asia has historically lacked an effective mechanism for regional cooperation. The Greater Tumen Initiative (GTI) is the only existing intergovernmental effort for cooperation in Northeast Asia, evolving from the Tumen River Area Development Programme (TRADP) launched by the United Nations Development Programme (UNDP) in 1991 to facilitate trade and investment and promote sustainable economic development. With a membership of five countries including China, Mongolia, North Korea, South Korea, and Russia, many experts regard the Tumen project a failure as both a regional economic scheme and a mechanism to protect the Tumen River Basin's ecosystem.

This economically attractive yet politically complicated project has brought some development to the region. However, the environmental impact of this growth, particularly within China, has raised concerns among environmentalists given the prevalence of rare species in the river basin's ecosystem and potential devastation from unchecked development. This concern is ironic considering that the environment was one of the first focus areas of Tumen cooperation, attracting 85 percent of total program funding by 2004 and serving as the cross-cutting sector among the priority areas of energy, trade and investment, transportation, and tourism (Tumen Secretariat, 2005).

Jilin Province has been the key participant in the GTI on the Chinese side. The idea of Tumen cooperation first unfolded in Jilin in the 1980s as a result of collaboration among experts and officials at Changchun's Northeastern Normal University, the China Center for International Studies, the East-West Center in Hawaii, and the State Science and Technology Commission (Cotton, 1996). Despite the weaknesses of the Tumen project, regional cooperation has clearly benefited the provincial economy through dynamic interactions between central, local, and regional efforts to attract foreign trade and investment. The province is also cooperating with domestic and regional "green" nongovernmental organizations (NGOs). As further growth puts greater pressure on the environment, Jilin's economic outreach also has involved progressive environmental initiatives that reflect this central-local-regional dynamic.

DEVELOPMENT VERSUS POLLUTION

China is the main source of pollution in the Tumen River area, with 70 percent of the watershed located in the Yanbian Korean Autonomous Prefecture in Jilin. Two state-owned pulp and paper mills in Yanbian account for over 90 percent of the river pollution from Chinese sources but also importantly support Yanbian's town economies (Tumen Secretariat, 2002a). Water pollution is the most serious problem, threatening the health of the 2.2 million local Chinese who rely on downstream water for farming and drinking, destroying fish stocks across the region, and affecting coastal waters of North Korea and Russia. In 2006, the China's Ministry of Environmental Protection (MEP) indicated the water quality of 75 percent of the Tumen River as Class V, unsuitable for natural reserves or drinking, or domestic, industrial, and agricultural use (SEPA, 2007).

Pollution of surface water had already reached high levels in the early phases of Tumen coopera-

The Tumen River as the China-North Korea-Russia Border.
Photo Credit: Author

tion, mostly from industrial sources (Zhu, Li, & Lu, 1997). According to Chinese researchers, the development of urban infrastructure, especially water treatment facilities, have lagged behind rapid urbanization and industrialization in the Tumen region (Wang, Wang, & Yang, 2002). Further commercialization is likely to drive local growth while exacerbating the environmental challenges. The Hunchun Border Economic Cooperation Zone in Yanbian was established in 1992 without an environmental impact assessment, which was undertaken seven years later amid the pressures of rising investment (CRAES, 2000). A joint study by South Korean and Chinese environmental organizations in 2001 found that large-scale development projects have led to significant deterioration in water quality, with up to 80 percent of the river unsuitable for even industrial use and a decline in wildlife in the river area ("Tumen River polluted," 2001).

Since the Tumen River is a border river between China, Russia, and North Korea, the key constraint to environmental protection has been the lack of sustained political support from all participating governments. Although Russian water quality monitoring data has indicated some progress over the years, further regional cooperation is required to address Tumen River pollution in a more comprehensive and integrated manner (MOE, 2002).

MULTILATERAL ENVIRONMENTAL COOPERATION

The GTI addresses common environmental concerns throughout its focus sectors, integrating such issues as clean technology, ecologically sustainable tourism, and climate change into its development projects. Environmental work is led by the TumenNet initiative of the Global Environmental Facility (GEF), jointly financed by the World Bank, UNDP, and the United Nations Environment Programme (UNEP) (UNDP, 2002). TumenNet's Strategic Action Programme (2006-2015) sets the basic foundation for long-term regional environmental cooperation, with a particular focus on biodiversity and water issues.

This action plan remains unsigned due to disagreements among some member states. However, several important initiatives have continued under the broader GTI framework. Most notable are public-private partnerships in clean production and the modernization of waste treatment facilities. Current efforts in this direction include a Feasibility Study on Tumen River Water Protection, a multinational project for 2008-2010 launched by Japan's Economic Research Institute for Northeast Asia to monitor water quality in the Tumen River and develop corresponding policy tools for water protection (Tumen Secretariat, 2007a). As an initial step to clean up the Tumen River, the Finnish government in 2002 funded two pre-feasibility studies on upgrading Yanbian's pulp and paper plants, in collaboration with the United Nations Office for Project Services and the China International Center for Economic and Technical Exchanges (Tumen Secretariat, 2002b). Given the wide inconsistencies in environmental data within and between the five member countries, the GTI Environmental Cooperation project proposed in November 2007 aims to harmonize data collection methods and transboundary environmental criteria, build national and local assessment capacity, and promote multilateral cooperation on development planning (Tumen Secretariat, 2007b).

To coordinate the various environmental efforts of the GTI, the 2007 Consultative Commission meeting produced the Cooperation Framework on Environment (CFE), including a coordination unit

and functional working groups (UNDP, 2007). As a formal mechanism for regional environmental cooperation, the CFE is important for strengthening existing initiatives while negotiations continue for a long-term action plan.

JILIN'S ENVIRONMENTAL OUTREACH

The inaugural meeting for the TumenNet action plan in 2002 recognized China's progress in addressing water pollution of the Tumen River (MOE, 2002). While many environmental groups have pointed to the risks of developing the region, environmental protection has depended on the local response to Tumen cooperation and development. In addition to the regional efforts of the GTI, Jilin's environmental outreach has been complemented by central policies, local initiatives, bilateral and international cooperation, and public participation.

Under the TumenNet program, the Jilin Provincial Institute for Environmental Protection leads the regional effort to develop an Environmental Information System, designed to manage regional data on international waters and biodiversity. A series of meetings on environmental issues concerning offshore oil and gas development, the mining sector, and other areas have been held to build capacity among local experts and raise awareness among government officials. Along with TumenNet, the United Nations Educational, Scientific and Cultural Organization (UNESCO); and Green Yanbian (a Jilin-based NGO); the Yanbian prefectural government has held workshops on northeast Asian environmental cooperation focusing on conservation and development in the Tumen River area (Korean National Commission for UNESCO, 2001). These workshops have served as an important forum for discussing international approaches to environmentally-sustainable development.

Provincial laws and regulations in Jilin have followed developments in national environmental legislation establishing maximum levels of pollutants for wastewater and solid waste. Completed and ongoing projects include sewage treatment facilities for the Kaishantun chemical fiber pulp plant and Shixian paper mill—the two plants responsible for the bulk of the water pollution—and municipal wastewater and garbage treatment plants in the cities of Yanji, Hunchun, and Longjing, Yanbian's major economic centers.

Bilaterally, the Yanbian prefectural government and the Korea Environment Institute have been cooperating on personnel exchanges and joint research for the protection of the Tumen River in recent years ("South Korea says," 2003). Jilin's environmental concerns have also attracted financial and technical assistance from international donors, addressing the funding inadequacies of the GTI. The Asian Development Bank (ADB) is extensively involved in Jilin's water resource management and urban infrastructural development through projects that aim to improve the water quality of Tumen and other river basins in the province (ADB, 2006). At the local level, the ADB is also supporting the Yanji municipal government and the Yanji Municipal Sewerage Treatment Company to expand the wastewater treatment capacity in Yanji city (ADB, 2007). ADB involvement is important not only for funding but also for its experience in fostering cross-border economic cooperation through the Greater Mekong Subregion (GMS) initiative in Indochina.

Finally, the environmental implications of Tumen development have prompted regional cooperation among environmental NGOs. South Korean and Chinese environmental groups including Green Korea United (GKU) and Greenpeace China have launched a joint campaign to protect the Tumen River and Changbai Mountain on the Sino-Korean border ("Environmental groups," 2000). Green Yanbian in Jilin has actively promoted Tumen protection since its establishment in 2000 by ethnic Koreans returning from South Korea (Awaji, 2006). Modeled on South Korean environmental NGOs, the group is 80 percent ethnic Korean and leads the exchanges between Chinese and Korean NGOs on the Tumen region. Sponsored by TumenNet, the two NGOs Green Yanbian and GKU worked together in summer 2001 to monitor the environmental situation along the Tumen River and raise awareness both locally and in South Korea (GKU, 2001). Green Yanbian has now expanded contact with other Chinese NGOs and environmental experts in Beijing and Northeast China.

Greater international contact especially between Chinese and Korean NGOs could strengthen the role of local environmental groups like Green Yanbian. However, NGO activities in Northeast Asia have often been hampered by diplomatic considerations, furthering the already significant restrictions on NGOs in China. When Green Yanbian conducted a month-long environmental study along the Tumen River in May 2001, Chinese authorities did not allow the group to release their

> **When Green Yanbian conducted a month-long environmental study along the Tumen River… Chinese authorities did not allow the group to release their findings on…pollution and watershed damage arising from activities in the North Korean side."**

findings on the extent of river pollution and watershed damage arising from activities in the North Korean side (Awaji, 2006).

SUSTAINABLE COOPERATION

Despite the challenges faced over a decade of engagement, member countries in 2005 extended the period of Tumen cooperation for ten more years, taking full ownership of the project with continued support from UNDP. The GTI has now evolved into a geographically larger, country-driven, and private sector-focused effort. Although the Tumen project has suffered from limited high-level political support and a lack of funding, cooperation in energy, trade, transport, and tourism has increased substantially from nonexistent levels in 1995 (Meyer, 2004).

Each member country joined the GTI for different reasons. Having first conceived the idea of Tumen cooperation, China is primarily driven by the need to boost its stagnating northeast region. Domestic policies have played a major role in shaping the course of both economic and environmental cooperation in Northeast Asia. With transboundary implications, environmental protection in the Tumen region requires both domestic and regional action. Just as the GTI has dynamically shaped Jilin's economic strategies, continued development has also demanded coordinated environmental adaptations at central, local, and regional levels.

The GTI has progressed against a unique historical setting where political tensions have undermined any cooperative programs. Although geographically and ethnically the Tumen region presents significant advantages, sensitive political issues weigh heavily on the prospects of cooperation. Given its volatile geopolitical situation, the Tumen River Basin is among the world's 17 river basins identified by UNESCO as potential conflict zones for water disputes in the near to long term ("Agency will mediate," 2003). The GTI's success depends critically on sustained political commitment from all member countries to make the Tumen project both a feasible and necessary effort. While the GTI as a whole faces considerable political obstacles, Jilin's response suggests that multilateral cooperation may positively shape provincial environmental efforts in China.

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FEATURE BOX

Social Science Research Council's China Environment and Health Initiative

By Jennifer Holdaway

Since 2006, the China Environment and Health Initiative (CEHI) of the Social Science Research Council (SSRC) has been assessing the current state of knowledge about environment-related health risks in China, and the responses of state and societal actors. In April 2008, CEHI organized an *International Workshop on Environment and Health in China: Perspectives from the Disciplines*. The meeting brought together health and environmental scientists, along with social scientists working in the fields of anthropology, sociology, political science, and legal studies to discuss the state of the field in China and share their disciplinary perspectives. A set of papers from the meeting will be published as a special issue of the *Journal of Contemporary China* in winter 2009.

The mapping process that took place at the workshop revealed that although concern over the health impacts of environmental change in China is mounting, the capacity of government and civil society to respond effectively remains weak. Environment and health remain largely separate streams of research and policy, and the knowledge base to inform policy and other responses is thin.

As many articles in the *China Environment Series* have illustrated with regard to specific environmental health problems, policy initiatives in China are fragmented, with multiple agencies involved in monitoring and responding to various environment-related health threats—often with limited success. Although many environmental health problems are rooted in complex political, economic and social contexts, most responses are reactive and focus on technical solutions. Rarely do these responses address the underlying need to integrate concern for the health impacts of environmental change into development policy at the national and local levels, or involve all the parties whose cooperation is necessary to ensure results.

"…with regard to specific environmental health problems, policy initiatives in China are fragmented, with multiple agencies involved in monitoring and responding to various environment-related health threats—often with limited success."

MIND THE RESEARCH GAPS

To date, the contribution of the social sciences to our understanding of these environmental health problems in China has been minimal, but there are many areas in which research is needed. For example, there is much discussion of the need to increase public awareness and participation with regard to environmental health, and an assumption that more information will necessarily translate into improved enforcement. However, we know from other policy areas (for example, efforts to reduce smoking or HIV/AIDS in China and elsewhere) that the relationship between information and behavior is

by no means straightforward. Researchers and international environmental organizations operating in China currently have very little understanding of what Chinese officials or ordinary people actually know about environmental health risks, where their knowledge comes from, and how they interpret and act upon it in the context of other influences, including economic interests, social relationships and personal identity. Without such knowledge, efforts to increase awareness and participation are unlikely to be effective.

Local protectionism and corruption are serious problems blamed for the failure to implement more effective measures to protect the public from environmental health threats, yet there is little detailed analysis of the very real constraints that local governments face in addressing these problems. These include: (1) the need to generate revenue to provide public services, often in the context of limited development options; (2) a lack of staff with the necessary training to enforce regulations or diagnose and treat environmental health problems; and (3) performance standards that still emphasize economic growth indicators over public health and environmental protection. Without a better understanding of these constraints and how they might be addressed, improving enforcement will be hard.

China's enormous diversity in terms of natural, economic and human resources means that the causes of environmental health risks, and potential responses to them, cannot be understood without research in specific locations and on particular populations. Also, the tangled web of economic, institutional and socio-cultural factors involved means that a multi-disciplinary approach is necessary.

CEHI ADDRESSES THE UNDERLYING PROBLEMS

In the second phase of its work, CEHI is seeking to stimulate multi-disciplinary research that can inform policy and other responses to environmental health problems. In December 2008, with support from the Rockefeller Brothers Fund, SSRC made seven grants for collaborative research on environment and health in China.

Each of the seven teams funded by SSRC includes both social scientists and health or environmental scientists who will work together to research some of the most challenging environment-related health risks facing rural areas in China: non-point source pollution; health risks posed by intensive animal husbandry; pollution from rural industry and mining; and health problems associated with changes in agricultural practices and lifestyles.

"Researchers and international environmental organizations operating in China currently have very little understanding of what Chinese officials or ordinary people actually know about environmental health risks, where their knowledge comes from, and how they interpret and act upon it."

Each project includes a focus on some aspect of governance, including the ways in which fiscal constraints affect efforts to provide safer drinking water; the potential for farmers' cooperatives to play a role in reducing the risks to health associated with intensive livestock farming; and the ways in which risk awareness shapes citizen responses to rural industrial pollution. Research will be conducted in six provinces in southern China.

FOREHEAD

In order to provide a platform for sustained communication and collaboration among researchers, policymakers and others concerned with environmental health problems, SSRC has now joined with a consortium of Chinese institutions to establish the Forum on Health, Environment and Development in China (FORHEAD). This forum will expand the knowledge base through interdisciplinary working groups that will synthesize current research on particular topics and provide the basis for the development of cross-disciplinary and cross-institutional collaborations. FORHEAD will hold an annual conference featuring new research, policy and NGO initiatives in the field, as well as organize an in-

terdisciplinary Summer Institute that will provide intensive training for early career researchers and NGO staffers. Through seminars and other activities, FOREHEAD will seek to make research on environment and health issues available to a broad range of publics in China. Background and updates on FOREHEAD work can be found at: http://programs.ssrc.org/eastasia/forum.

China Environment and Health Resource Hub

Another barrier to progress in addressing environmental health problems in China is that existing knowledge is scattered and often not easily accessible. As an ongoing part of its work, CEHI is continuing to develop tools to make information about environment and health more widely available in forms that are useful to a range of audiences. The program has established an online searchable database, The China Environment and Health Resource Hub, which contains over 3,500 references to relevant literature, as well as information about organizations and individuals working in this field. The research hub can be found at: http://ceh.resourcehub.ssrc.org.

Translation Work

CEHI is also organizing the translation of a number of key articles relating to environment and health, including essays that illustrate important conceptual or methodological approaches from across the disciplines or that report policy and other responses being employed in other countries. A first set of translations will be published in March 2009 as a special issue of the journal of the Yunnan Health and Development Association. Others will be published online as they become available.

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SPOTLIGHT

Eco-Toilets in Turpan: Improving Sanitation and Water Quality in Xinjiang

By Daniela Salaverry

In September 2008, I flew to western China's Xinjiang Autonomous Region to visit a pilot project installing eco-toilets in a small village near Turpan. As Xinjiang is on the brink of a public health crisis due to increasing water scarcity, pollution, and problems exacerbated by climate change, one local environmental NGO is taking action from the bottom up, literally. This year, the Xinjiang Conservation Fund (XCF), a grassroots NGO, is working with local residents and community officials to install eco-toilets in the small grape-growing village.

"This is the Gobi," says Dong Zhaolin, XCF's eco-sanitation project manager, as he points to the black rock desert outside the bus window. The Gobi is one of the world's largest deserts; at 1,295,000 square kilometers, it dominates much of Xinjiang. The region's unique landscape includes three mountain ranges (Altai, Tianshan, and Kunlun) and two river basins (Tarim and Junggar).

The stark contrast between pristine wildland, such as China's only old-growth Siberian forest near Kanas Lake in the north, and rapid development, including some of the world's largest oil fields, epitomizes Xinjiang's struggle with rapid development and environmental protection. Since the "Go West Campaign" of the late 1990s, Xinjiang has seen some of China's highest provincial gross domestic product growth rates. Xinjiang, a melting pot of Han Chinese, Uyghur, Kazak, and ten other ethnic groups, relies primarily on meltwater from winter snowpack to feed the rivers and meet the needs of a population of 20 million.

Turpan's traditional lifestyle still dominates the region—Uyghur farming families raise grapes and melons in the desert oasis town. The grape vineyards stay green and are well watered, despite summer temperatures reaching higher than 45 degrees Celsius; this is attributed to the *karez*—an ancient underground aquifer built thousands of years ago to carry freshwater from the mountains to the residents and vineyards of Turpan. The farmers of Turpan represent China's rural population, many of whom live on less than 1,000 dollars a year, relying on the income from the autumn harvest to stay afloat year-round. Living in one-room mud brick homes, Turpan's farmers also have limited, if any, sanitation and waste treatment resources.

Unfettered development, combined with the threat of climate change has caused many to become concerned over water availability in this already fragile region, and specifically how water scarcity may impact public health. XCF is working with farming villages in Turpan to educate residents on water conservation and on the importance of sanitation to improve public health and water quality, while also installing eco-toilets.

XCF is working with farmers in Turpan to help keep water in the ancient *karez*, as well as in the modern reservoir, free from human waste contaminants by means of installing eco-toilets. XCF's overall goal is to develop a zero-waste waste treatment system where microorganisms can process urine and feces, upon which waste matter is dehydrated and ultimately used as fertilizer. XCF is not only educating village residents and farmers on public health and sanitation issues, but also is planning to install 50 eco-toilets in one farm village in the region.

Xinjiang is China's "Wild West," and environmental NGO work in the region is in its nascent stage. In fact, XCF is the region's only grassroots environmental NGO. Given the complex cultural and political landscape in the province, XCF staff members have to build strong relationships with local government and researchers to gain support for projects.

To launch the eco-toilet pilot, XCF's Dong Zhaolin, a Han Chinese from Urumqi, has worked for over a year to build strong partnerships with local government and village representatives, especially since he is not a local resident. Furthermore,

Outdoor Ecotoilet being built in Turpan by the Xinjiang Conservation Fund for eco-sanitation development in Xinjiang. Photo Credit: Daniela Salaverry

he needed to find a local representative who would help him navigate the language barrier during his outreach and education campaigns. Another challenge to implementing the eco-toilet project was cost—rising inflation rates required the group to temporarily cut its projected number of toilets from 50 to 10. Despite these challenges, the low-tech project received a positive response from local government and villagers especially because there is little existing sanitation, and people are eager to improve their homes and lifestyles.

Over the past year, Dong and his new partners from the village and county governments went door-to-door interviewing over 50 families, assessing their interest in and need for an eco-toilet. Dong also worked with the local governments to host public information meetings, where up to 40 could people come and learn about the eco-toilet project and various methods to reduce waste and improve sanitation in the home. This ongoing community organizing approach has been crucial to building broad-based support in the village. The toilets themselves are popular as well, requiring no water, and are great alternatives to water-intense modern sanitation, or no sanitation at all.

As of October 2008, XCF staff and volunteers have begun the building and installing of their initial eco-toilets. Once these pilot toilets are installed and completed, Dong will begin his next phase of community organizing, which includes educating users and providing follow-up trainings on maintenance. Furthermore, it is only after these toilets are installed and used that XCF will be able to truly measure the sanitation and environmental improvements of these eco-toilets. XCF also will gather feedback from the families where the toilets are installed to determine how the toilets improved health. Dong is confident that because the pilot project is small, XCF will be able to conduct adequate follow-ups and in determining the impacts of the eco-toilets. XCF plans to replicate this pilot project in other farming villages near Turpan in the coming year.

This project's origins are no doubt humble, but there could be resounding impacts from this initiative. It has huge potential for making a difference in this underserved region, especially as existing water quality and sanitation problems become exacerbated by climate change.

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COMMENTARY

Double Benefits: Saving Energy and Reducing Emissions in Hainan

By Lei Bi & Qian Wang

Ratification of the Kyoto Protocol marked a historical step of global efforts in reversing the inexorable increase of greenhouse gas (GHG) emissions (Dagoumas, Papagiannis, & Dokopoulos, 2006). The progress not only affirms quantitative obligations[1] for industrialized countries to limit emissions of GHGs, but also exerts intense pressure on developing countries to consider controlling their uses of carbon-based energy sources (Boyd & Ibarraran, 2002). As a developing country, China was not subjected to the quantitative commitments of the Kyoto Protocol. However, the Chinese government has included saving energy and reducing emissions (*jieneng jianpai*) as a national environmental policy in the 11th Five-Year Programme (FYP, 2006 - 2010), driven in great part by the high costs of pollution to the national economy and public health (CNDRC, 2005). According to the 11th FYP, China aims to reduce energy consumption per unit of GDP[2] by 20 percent and overall emissions[3] by 10 percent from 2006 to 2010 (CNDRC, 2006). To fulfill these goals, the Chinese government has established specific energy saving and pollution reduction objectives for its provinces and regions and begun evaluating local officials on their ability to meet these "green" goals (CNDRC, 2006) Understanding how some provinces are working to fulfill these objectives offers insight into what China's capacity could be in the upcoming global climate agreement.

HAINAN PROVINCE: LOCAL FULFILMENT OF CENTRAL GOVERNMENT REQUIREMENTS

Hainan is the smallest and among the most economically backward provinces in China (HPBS, 2004).[4] Thus, the Chinese central government has assigned Hainan comparably lower objectives for saving energy and reducing emissions in the 11th FYP (CNDRC, 2006). Specifically, Hainan is slated to reduce its per unit GDP energy consumption by 12 percent from 2006 to 2010, which translates to a drop from 0.92 tons of coal equivalence (TCE) per 10,000 Yuan in 2005 to 0.81 TCE per 10,000 Yuan in 2010 (CNDRC, 2006). With comparably lower levels of industrial emissions,[5] the central government requires Hainan to control and maintain the current emission levels from 2006 to 2010. This means maintaining the annual chemical oxygen demand (COD) emissions at 95,000 tons; SO_2 emissions at 22,000 tons; recycle/reuse at least 75 percent of industrial solid wastes; and treat 70 percent of municipal wastewater (CNDRC, 2006).

Although air and water pollution on this island province is not as severe as some its mainland counterparts, the Hainan government has seen how pollution has seriously damaged the economy and human health in other provinces.[6] This awareness led the Hainan government to formulate the "Eco-province" strategy in 1999, which lays out clear requirements of energy efficiency and emission reduction actions (HLER, 1999). Notably, the Hainan government has given local governments considerable leeway in how they meet these requirements.

ACTIONS IN HAINAN

The energy conservation and emissions reduction work under the Eco-Province strategy was catalyzed in 2006 with the enactment of the *Comprehensive Working Plan of Saving Energy and Reducing Emissions in Hainan,* which lists specific tasks for all agencies in the province. The actions in Hainan are carried out in two primary areas—controlling the access of new industries and improving the performance of existing industries.

Controlling the Access of New Industries

Since 2006, the provincial government of Hainan has scrutinized the establishment, rebuilding and expansion of industries in the province to ensure new facilities are not energy intensive or highly polluting. The provincial government only approves projects that pass a series of rigorous environmental, land use, and energy input assessments, which are needed to obtain a government building permit. Without the permits, it can be difficult to receive loans. New projects that potentially save or replace petroleum or coal products (such as plants that use biogas to meet energy needs) are given government preference. Through these approval policies, research and development of renewable energy technologies have made considerable progress in Hainan. For example, use of solar energy is incorporated into nearly all building construction and lighting projects in Hainan. The adoption of solar water heaters has accelerated especially in Hainan's rural areas. In addition to the current wind power plant in Dongfang, another 4 wind power plants with a total generating capacity of 50 million watts was established in Hainan by 2008. Biomass and other alternative fuels have been adopted as well, as evidenced by a lepra tree planting project in Wenchang and various large biogas projects surrounding large factory farms.[7]

Improving the Performance of Existing Industries

The Hainan government requires existing industries to increase energy efficiency and reduce emissions, and designates specific objectives for important industries to achieve. Since 2006, the provincial government has put increasing restrictions on small-scale industries that are high energy consumers and pollution emitters.[8] Not only has the export of products from these industries been controlled, but small factories with poor environmental performance have been denied electricity supply and are being eliminated gradually. For instance, a number of small-scale iron and steel production factories have been closed and the production of solid clay brick was banned in Hainan by the end of 2007.

Currently, operation of four electricity generators from Huaneng Power Plant in Haikou is being interrupted to install desulphurization equipment. Of the current 4 million-ton shaft kiln cement production in the province, 2.5 million tons will be discontinued by 2010. While shutting down small industries, the provincial government encourages large companies to establish environmentally responsible industries in Hainan. For example, the new 8 million-ton oil refinery project, developed by China Petroleum and Chemical Corporation in Yangpu, has embraced an investment of 3 billion Yuan for environmental protection. The investment aims to ensure waste gases from production are reclaimed and wastewater is treated with high environmental standards before being released for safe agricultural use.

> **"…cement production in China is the leading emitter of particulates, which cause serious respiratory problems in surrounding communities."**

CHALLENGES

Despite the admirable energy efficiency and emission reduction policies under the Eco-province strategy, Hainan did not meet the per unit GDP drop in energy consumption goals of 2.5 percent in either 2006 or 2007. Rather, both the overall energy input and energy consumption per unit of GDP in 2007 rose slightly higher than 2006 (Li, 2008). Although the existing industries in Hainan did reduce the per unit of GDP energy consumption in 2007, a number of new energy intensive industries came into production—such as the 0.6 million methanol project developed by China National Offshore Oil Corporation in Dongfang—which offset the energy-saving efforts from existing industries. The overall air and water emissions also increased slightly in both 2006 and 2007, mainly because no new sewage plant projects were completed and the sulphur removal project of Huaneng Power Plant in Haikou had not yet been completed (Li, 2008).

The failure of saving energy and reducing emissions in 2006 and 2007 has increased difficulties for Hainan to meet the national requirements. In other words, Hainan needs to reduce the energy consumption per unit of GDP by 3.6 percent in 2008, 2009, and 2010. Since the current levels of industrialization of Hainan are not high, there is a limited potential of

Authors and local researchers in a roundtable discussion of Hainan's Eco-province efforts.
Photo Credit: Lei Bi and Qian Wang

saving energy input and reducing emissions within existing industries. Some headway could be made if the urgently needed sewage and solid waste treatment plants are constructed, but funding for such projects is slow due to a shortage of funding, exacerbated by the global financial crisis. Additionally, plentiful oil and natural gas resources are being discovered in the South China Sea surrounding Hainan, which offers major industrial and development opportunities for this poor province.[9] If Hainan does end up increasing its oil and gas consumption to fuel growth, it will be extremely challenging for Hainan to meet the national requirements of saving energy and reducing emissions.

OPPORTUNITIES

With constraints of limited funding, technologies and personnel, industries in Hainan have opportunities to strengthen international cooperation through Emission Trade, Joint Implementation and Clean Development Mechanisms, which are supported by the Kyoto Protocol. Although the national requirements are difficult to meet, Hainan certainly has the potentials to improve its current industrial structure and productivity. As a Hainan official explained (Interview, 2007), if the annual old and waste iron and steel of Hainan could be collected and processed together, the province could save massive amounts of energy. If the current 4 million ton shaft kiln cement facility is transformed into a rotary kiln facility and equipped with electricity generators to make use of the excess heat,[10] the annual total energy input in Hainan's cement production could be reduced by 50 thousand TCE. The retrofitted kiln could save 300 million KWh in annual electricity consumption. Lower energy use and more efficient cement production also means less air pollution—cement production in China is the leading emitter of particulates, which cause serious respiratory problems in surrounding communities. In Hainan's building sector, if the annual 1 billion solid clay bricks could be replaced with new energy-saving wall materials, the annual energy consumption savings in construction could be at least 60 thousand TCE. In total, the above projects could save energy of 160 thousand TCE and approximately 400 million KWh in electricity in Hainan (Interview, 2007).

POLICY IMPLICATION

Given the challenges and opportunities that Hainan has, technical innovation is strongly encouraged in

existing industrial sectors to upgrade the current industrial structure of Hainan. The average energy efficiency of industries in Hainan can be increased by developing waste recovery activities—which is an area that the newest McKinsey Company report *China's Green Revolution* (2009) identified as a potentially significant area for CO_2 emission reductions in China. Wastes and by-products, especially the excess heat present major cost and energy saving opportunities. At present, the total facility capacity of generating electricity from the remaining heat of cement production in Hainan is about 15,550 kilowatts which could produce 100 million KWh annually. In the oil and gas processing and papermaking industries, the total capacity for generating electricity from waste and excel heat is 258 thousand kilowatts, which could produce 1.1 billion KWh in annual electricity generation (Interview, 2007).

Hainan's "to-do" for strengthening its Eco-province strategy is long—continue to close small factories with low productivity and high emissions; encourage low-energy industries; increase renewable energy and alternate fuels development; promote energy efficiency, and encourage low energy industries. Major public campaign and incentives to improve energy conservation will be crucial. For example, encouraging people to lower of indoor air conditioning to 26 degree Celsius alone could have a huge impact on the Hainan's energy savings. According to provincial estimates, summer air conditioning use accounts for a quarter of the total energy load in the province (Interview, 2007).

All of these strategies will demand much better environmental governance in the province along with capacity-building initiatives, such as the creation of a provincial energy saving center to help formulate and implement accountability assessment methods to meet energy consumption and emission reductions. The government could also enfranchise the local government with the rights to adjust electricity prices so they can use market incentives to promote energy saving and lower emissions.

The Chinese government has been reluctant to set specific caps on GHG emissions for as the Hainan case illustrated, many provinces struggle to meet even domestic energy efficiency and emission reduction targets. The current global economic crisis could make it even more difficult for local governments in China to invest into cleaner technologies necessary to improve pollution emissions. However, as the Hainan case illustrated, China's provinces are taking significant steps to reduce energy consumption and pollution, which opens up opportunities for international cooperation in joint technology development, energy conservation, water recovery, and policy design—all areas in which could help China's provinces make more progress in lowering overall emissions as their local economies continue to expand.

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NOTES

1. According to the Protocol, developed countries referred in Annex I are obliged to reduce their emissions of GHGs some 5% below their country specific 1990 levels in the period 2008-2012 with penalization clauses in case on non compliance (UNFCCC, 2003).

2. The Chinese per GDP energy consumption in 2005 was 1.22 Tons of Coal Equivalent [TCE] per 10,000 Yuan RMB (CMEP, 2006).

3. Specifically in 2005, waste water 52.45 billion tons, amount of Chemical Oxygen Demand [COD] 14.14 million tons, ammonia and nitrogen 1.50 million tons, sulphur dioxide 25.49 million tons, dust 11.83 million tons, industrial solid wastes 1.34 billion tons (CMEP, 2006).

4. Due to previous military considerations, the Chinese central government had paid little development attention to Hainan prior to 1988 (Xu, 1988).

5. Since Hainan is still dominantly rural, the provincial economic development is much based upon agriculture and the recent rapidly expanding tourism industry (Gu & Wall, 2007). As a result, levels of industrial emissions of Hainan are comparably lower than some of other highly industrialized provinces, such as Jilin, Shanxi, and Gansu.

6. In mainland China, the costs of environmental pollution to the national economy in 2004 reached 511.8 billion Yuan RMB, equivalent to 3% of the GDP. About 300 million rural people did not have access to clean fresh water and 400 million people in mega-cities exposed to polluted air. In the 11 biggest Chinese cities, 50 thousand people died and 40 million people got infected with chronic bronchitis in a year due to the heavy dust and particles in the air (CMEP, 2006).

7. Lepra trees are used to develop biodiesel or other biofuels in the project.

8. Particularly cement manufacturing, iron and steel production, electricity generating, rubber processing, solid clay brick production and mining industries.

9. Among the 39 basins which were recently found, there are huge reserves of 15.2 billion tons of petroleum and 4,000 billion cubic meters of natural gases.

10. 360 thousand kw.

SPOTLIGHT

A Guardian for China's Western Rivers: The Hengduan Mountain Society

By Yang Yong (Translated and Edited by Jing Chen and Zhimin Mao)

I began to explore western China's rivers some 20 years ago. In 1986, I initiated and participated in the five-month Yangtze River scientific expedition—three Chinese teams and one American team racing to be the first to descend the upper Yangtze River on rafts. As the chief of a local environmental monitoring station in Sichuan Province, I was the only Chinese team member out of 15 with experience in environmental protection. At an elevation of 4,500 meters at the Yangtze River's headwaters, the expedition teams collected more than 1,000 hydrological and geological samples and took more than 3,000 pictures. The teams also investigated landslides along the river. My team made the descent before the American team, but at a great price. Five people lost their lives from my team alone; 10 total from the three Chinese teams. While this first comprehensive investigation of the Yangtze River was costly, it catalyzed a wave of expeditions by young Chinese scientists. The trip changed my life, inspiring me to become an independent geological scientist and investigator of China's rivers.

A NEW PATH AS A RIVER RESEARCHER

Since 1986, some of us who participated in the first Yangtze River expedition continued to explore rivers in the region, including the Jinsha and Yalong—tributaries to the Yangtze River—and rivers originating in Tibet, such as the Nu, Lancang, and Yarlung Zangbo. These rivers flow in areas characterized by extreme and dangerous geographic environments that few, if any, have visited. Through these explorations, we obtained considerable first-hand data on the geological and geographic conditions of western China and developed unique insights into ecological changes in the region.

In 1998, the Chinese government launched the Great Western Development Program. This program aims to increase economic development in remote areas of China, where per capita gross domestic product is significantly lower than the booming eastern urban areas. The program has notably spurred considerable new investment in dams and water transfer projects in southwest China, leading me to shift my research to investigate the feasibility and impact of these major river development projects. My research examines the impacts of the hydroelectric stations on the Tibetan Plateau and the western line of the South-North Water Transfer Project (SNWTP), which are among the largest river infrastructure development projects in human history.

HENGDUAN MOUNTAIN SOCIETY

The dams and water transfer projects in southwest China are but one example of how China's rapid economic development is degrading the environment at an ever-faster pace, resulting in increasingly visible conflict between development and conservation. With these challenges in mind, I established the Hengduan Mountain Society in 2004 as a nonprofit center for research and activism based in Chengdu. The Hengduan Mountain Society is a research network of over 500 volunteer scientists and students who—either as volunteers or consultants—help conduct research and gather data on river ecosystems in western China. Besides fieldwork in the Hengduan area—covering large parts of western Sichuan, Yunnan, and eastern Tibet—I often travel to Beijing to meet with nongovernmental organizations and research institutions to discuss the findings of my network, for the data we collect is unique and much appreciated by activists and researchers. Our direct cooperation with the government remains low, but is likely to increase in the future.

ADDRESSING HYDROLOGICAL PROJECTS IN WEST CHINA

As part of the Great Western Development Program, a number of dams and hydropower stations have been designed and constructed on China's western rivers. Many of these rivers are located on the Tibet Plateau and in southwestern China. In the face of this trend, the Hengduan Mountain Society investigated the area and found many potential geological, ecological, and cultural dangers associated with excessive and uncoordinated development in this area:

• **Complex Geological Activity**. Southwest China is one of the most geologically active and complicated regions in the world. Current studies on this area are not sufficient to explain many of the frequent natural occurrences including earthquakes, landslides, and sedimentation. The Wenchuan Earthquake in May 2008 exposed the risks of constructing dams on geologically active areas, as hundreds of hydropower stations were damaged to various degrees, leaving numerous unstable reservoirs a threat to downstream cities.

• **Complex Ecology**. This region is a world biodiversity hotspot, holding an important ecological function in not only China but all of Asia; it also plays a key role in maintaining the stability and water quality of the middle and lower reaches of the river basins in Southeast Asia.

• **Cultural and Historical Heritage**. This region is home to at least 10 ethnic minorities, with diverse traditions and cultural heritage, who face potential threats to livelihood due to resettlement from dam sites. There are also a number of World Natural and Cultural Heritage Sites and national nature reserves, all of which risk significant damage should these planned water transfer and dam projects be constructed.

DIAGNOSIS ON THE SOUTH-NORTH WATER TRANSFER PROJECT

Fifty-six years ago, Chairman Mao envisioned a solution to China's problem of uneven water distribution: "Southern water is plentiful, northern water scarce. Borrowing some water would be good." As water scarcity becomes an increasingly urgent problem in northern China, this imaginative and bold idea was picked up and converted into an ambitious project, known as the South-North Water Transfer Project (SNWTP). In 2002, the State Council, China's highest executive body, approved the construction of three canals for SNWTP, a project that has no comparable precedent in the world. The eastern canal is already transferring water and the middle line began construction, which was later halted in late 2008 due to conflicts and cost issues. The most expensive and difficult western line that aims to draw water from Sichuan is in the planning stage. Notably, provincial officials and researchers have formally complained about the central government's initial environmental impact assessment, which claimed the water transfer would have little ecological impact on the region.

In order to provide a truthful, independent, and objective feasibility analysis for the west line of SNWTP, the Hengduan Mountain Society organized and conducted studies on the western reaches of the Yangtze River between 2005 and 2008. In 2007 alone, the Hengduan team traveled twice to the Yangtze River Basin to collect ecological and hydrological data for both the summer and winter seasons. The research covered the Dadu and Min rivers, as well as the three major sources of the Yangtze River—the Chumaer, Tuotuo, and Dangqu rivers—and the planned SNWT western project area. This investigation found the following:

• The Hengduan mountain region, where the west line of SNWTP is planned, has high geological and ecological risks. Moreover, the area is frozen for over five months, making normal water transfer challenging.

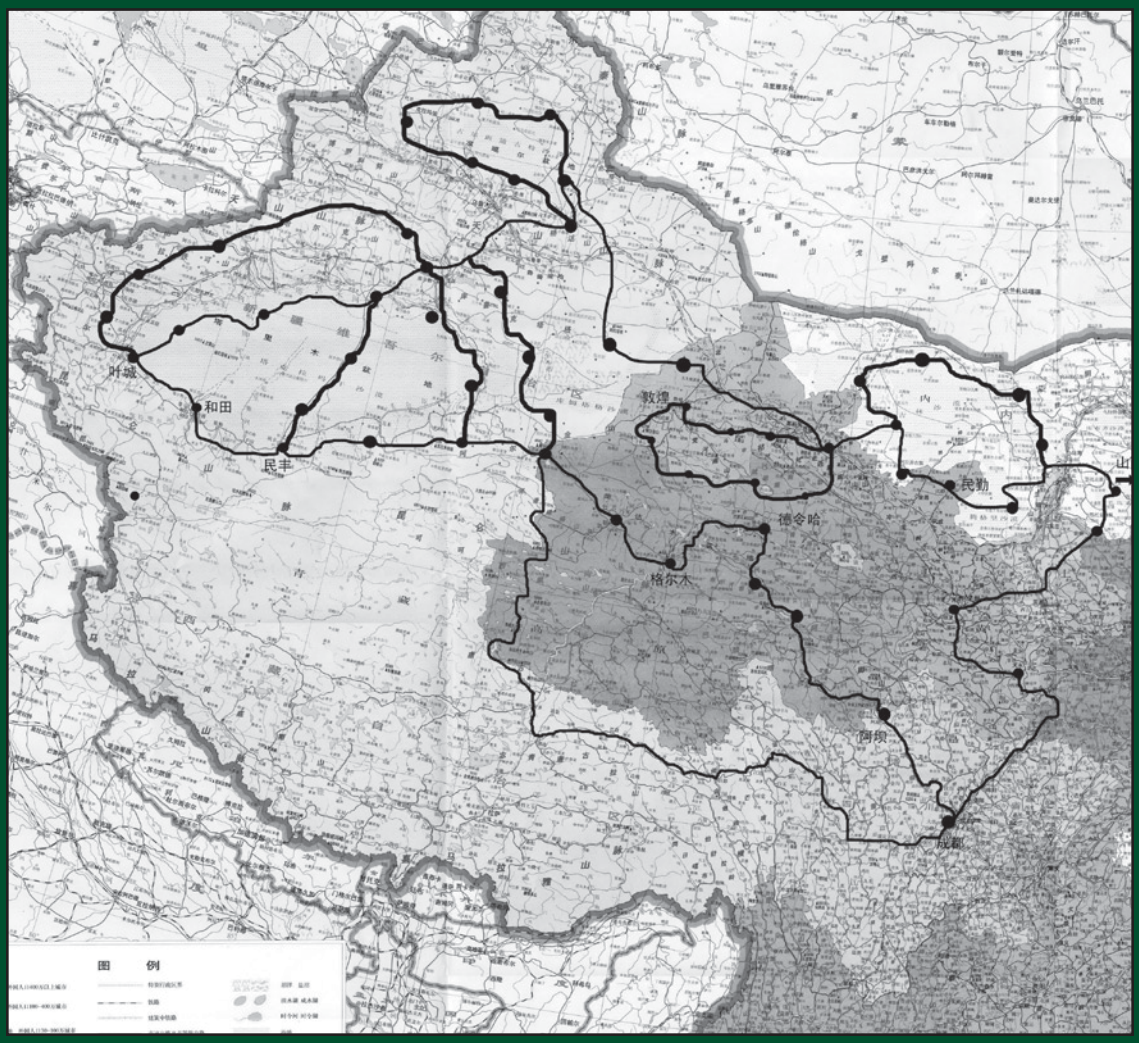
• In the three major sources of the Yangtze River, there are major environmental issues such as melting glaciers, pollution, increasing desertification, and shrinking rivers. Thus, water supply and quality are difficult to guarantee.

• Considering the mounting number of planned and constructed dams in the upper reaches of the Yangtze River basin, SNWTP will add significant pressure upon the already fierce struggle for water between different interest groups.

THE FUTURE FOR CHINA'S WESTERN WATERS AND HENGDUAN

In 2006, during our studies in the headwaters of the Yangtze River, I revisited the monument erected to the 1986 expedition team. The monument was originally built right next to the water, but today the

Map 1.



Source: Yang Yong

headwater is about 300 meters away. The sources of the Yangtze River have dried to a desperate level and under these circumstances SNWTP can only worsen the situation..

In late September 2008, the Hengduan Mountain Society started a new round of expeditions and investigations into northwestern China. Specifically, the study will investigate the possibility of exploiting glaciers and glacier runoff in the Kunlun and Qilian Mountain regions, and also the five major deserts in northwest China. The goal is to seek an alternative for the western line of SNWTP, which remains stalled, pending further research. Possible strategies include identifying the capacity of water resources in northwest China, changing the wasteful distribution of water to dirty industries in this region, and promoting water-saving lifestyles among households.

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COMMENTARY

How Far Will the Rising Tide of CSR Go in China?

By Sean Gilbert

Since 2005, interest within China in the concept of "corporate social responsibility" (CSR) has exploded. Influenced by a combination of domestic and international drivers, many leading Chinese companies find themselves at a crossroads where they need to redefine their image and engage in a discussion about their role in society. For the rest of the world, the way in which Chinese industry reacts to this challenge will have a profound impact on how environmental challenges in China and places much further afield play out in the coming decades. Despite the growing enthusiasm for CSR in China, the question remains how the CSR concept can help move Chinese industry to a new paradigm for development.

LAUNCHING A NEW WAVE

Over the last several years, Chinese industry has found its position in the world rapidly changing. Since China launched its economic reforms, the Chinese leadership's prioritization of rapid economic development has transformed the country's industrial economy. The reforms led to an initial social contract in which the key responsibility of business was to generate economic wealth by providing employment opportunities. Chinese officials and citizens initially perceived the environmental degradation and social inequalities of rapid industrialization as necessary evils or an unavoidable transitional stage.

For thirty years China has been a magnet for foreign investment mainly due to a large pool of cheap labor and the need for many suppliers of raw materials to be near labor intensive factories that serve as customers. At the same time, however, since the 1990s overseas buyers have had concerns over certain aspects of labor conditions and poor environmental management (e.g., use of lead or hazardous substances in products). Buyers have been the main source of pressure, however. Consumer protection and environmental activists in the west have usually targeted major North American and European multinationals to seek supply-chain performance standards to ensure safer products, rather than complaints directly at Chinese companies.

In recent years, pressure on Chinese companies has emerged from domestic forces. For example, local communities and workers in China have started to become much more assertive in their relations with industry when their own quality of life is affected. There are plenty of anecdotes about workers starting to demand better working conditions rather than simply accepting any job that pays. Of growing concern to Chinese officials is the increasing number of protests against highly polluting factories. [*Editor's Note: See Ma Tianjie's feature article on environmental mass protests in this issue for more details on protest trends*]. Internationally, Chinese companies also are finding themselves suddenly in the spotlight for the first time with regards to their own operating practices as they rush to develop new resources internationally and begin to enter overseas consumer markets. Deservedly or not, China's business community is finding that it is facing a new set of expectations and a visibility that did not previously exist.

This combination of internal and external pressures has now opened the door to what could become a fundamental change in Chinese industries and how they relate to the rest of the world. In 2005, Hu Jintao gave a speech in which he outlined several important policy principles related to China's development, including calling for a new economic

model, scientific development, and the creation of a harmonious society. The speech marked a turning point for many in the business community, sparking a flurry of CSR conferences in Beijing and other locations as companies—especially state-owned companies (SOEs)—tried to interpret what business was supposed to be doing to contribute to a "harmonious society." In January 2008, the State-Owned Assets Supervision and Administration Commission of the State Council followed with a new directive that raised CSR expectations for SOEs. Today, while many companies in China are now beginning to speak the language of CSR, in practice the results have covered a broad range.

PHILANTHROPY OR A NEW WAY OF DOING BUSINESS?

In Europe and the United States, the concept of CSR has evolved over time. Initially, the discussion focused on corporate responsibilities for compliance with environmental and social laws and being a good neighbor to fence line communities.

In the 1990s, this notion changed to exhort concepts such as eco-efficiency, cleaner production, and pollution prevention. Companies were encouraged to begin thinking in terms of production systems and product life cycles to look not just at their own facilities, but across the entire cycle of production from raw material procurement to final disposal (or hopefully reuse and recycling) to maximize environmental and social performance. The emphasis shifted to going beyond compliance, but still focused on operations and improving the associated processes and technologies. Essentially, doing the same types of activities, but more cleanly and safely.

Over the last ten years, the concept has evolved yet again in the west. CSR is now shifting its focus towards the products, services, and business models of companies to ask the question of how the business can gear itself to solve sustainability problems. This has led to the exploration of "bottom-of-the-pyramid" strategies, clean technology funds from the financial sector, and many other new ideas.

For many companies in China, CSR still has a strong overtone of community investment and philanthropy. Companies such as China National Petroleum Corporation (CNPC) with over a million employees operate in many poor areas and CNPC's leaders see investment in community infrastructure as one of their core CSR functions. Many companies highlight their community investment programs as the way to demonstrate their sense of commitment to wider society with the hopes of being seen as a "responsible" company.

Products and services come into play for some companies, but they often walk a fine line between simply extending market reach and being part of a vision of China's development. For example, China Mobile identifies extending the mobile network in China as one of its four pillars of CSR. On the one hand, one would expect a mobile phone company to extend its network as a routine part of its business, and it could be questioned whether this is part of CSR. However, communications access does contribute to opportunities for development, and, in a country where large parts of the population still live in poverty, could offer a legitimate vision of a social contribution. Similarly, Chinese oil companies and electric utilities often refer to providing stable energy supplies as part of their CSR—a message which western oil companies also promote when they talk about their role in society.

The role of legal compliance in CSR is also not clear as some Chinese CSR specialists present compliance with environmental, health, and labor laws as examples of CSR. Many would argue—including those in the business community—that legal compliance is not a matter of responsibility or contribution. Rather it is an obligation, and companies that do not comply deserve punishment under the law. But does this hold true in a situation like China where widespread non-compliance with law is the norm and compliance with law is already an action that represents above-average performance? Over the long term, it is hard to see how a society could function on such a basis. However, in the short term, it could be argued that Chinese companies that comply with laws are worthy of special recognition.

Regardless of the specific definition, the fact that Chinese companies are beginning to embrace dialogues about CSR offers a new opportunity for engagement that did not exist before. For example, some Chinese companies are beginning to warm up to the concept that they have a range of different stakeholders that they need to engage and become partners with in order to be a successful company. The milk contamination scandal provided sobering proof that Chinese companies will increasingly depend on maintaining a level of public trust and credibility in order to be able to operate. Despite this recognition, many Chinese companies struggle to identify with whom they

should engage to build this trust, particularly in an environment that lacks a highly active, membership-based civil society and also lacks active investors with a focus on these issues.

INDUSTRIES OF THE FUTURE

Alongside evaluating the operating practices of the existing industry base, there are also those who advocate for China to focus its energies on playing a leading role in developing the new technologies and industries of the future. Reports such as CCIED-WWF study on China's Ecological Footprint underline that China is at a crossroads in its development and the investments that the government makes in core infrastructure such as transport, power generation, urban design, and other areas will drive the country's consumption patterns for the next several decades.[1] In effect, China (and the world around it) will become locked into a mode of living and resource consumption patterns from which it will be almost impossible to escape for an extended period without massive reinvestment—quite similar to the position in which the United States finds itself in its reliance on personal transport. More focus should be put on developing new technologies in China—such as solar panels—for home and abroad that will lead to more sustainable consumption patterns. Initiatives such as the New Ventures program under the World Resources Institute embrace this type of ethos in helping Chinese small and medium enterprises develop business plans to secure capital.

TRANSPARENCY EMERGES

Parallel to this growth of CSR, Chinese businesses are increasingly finding themselves required to operate with more transparency. The Ministry of Environmental Protection (MEP) has been passing a series of laws that help increase public access to information and seek to link access to capital to environmental performance through a series of policies aimed at establishing "green" finance. So far, high-level government policies have been released that relate to banking, insurance, and equities (including new requirements for initial public offerings to disclose environmental risks), but these have not been elaborated in any detail (i.e., most lack implementing regulations). The initial focus has been on banking and measures such as translating the Equator Principles into Chinese. Depending on how these initiatives continue to unfold, they could become a powerful driver for CSR. Already major market regulators and institutions including the People's Bank of China, MEP, and the China Banking Regulatory Commission are actively thinking about these issues.

> **"The milk contamination scandal provided sobering proof that Chinese companies will increasingly depend on maintaining a level of public trust and credibility in order to be able to operate."**

At the same time as the regulations are evolving, voluntary disclosure is also growing. The directive from SASAC encourages SOEs to begin issuing voluntary reports on their sustainability performance, and the practice has been spreading rapidly. According to the Beijing-based CSR consulting company SynTao, 121 reports were issued in 2008, which represents a sudden and significant growth of activity. Many of these reports have drawn on or directly applied the *Sustainability Reporting Guidelines* of the Global Reporting Initiative.[2] In China there also has been growth in disclosure in relation to greenhouse gas (GHG) emissions, primarily in connection with the Carbon Disclosure Project and also with the GHG Protocol that was created by the World Resources Institute and the World Business Council for Sustainable Development.[3]

In many ways, the move towards transparency by Chinese regulators and businesses is following global trends. Promoting such transparency represents progress in CSR globally in two ways. First, many of the early adopters in China are using reporting as a means to begin building internal policies, procedures, and performance monitoring. Currently many companies lack the ability to adequately track and review their environmental and social impacts at the group level. Many current sustainability reports in China are light in quantitative detail because the data gathering systems simply do not exist for most Chinese companies. However, the process of reporting has stimulated significant internal initiatives to

develop data tracking systems, which could begin to deliver better information in the coming 2 to 3 years from Chinese companies. For example, China Ocean Shipping Company (COSCO) has built a new internal monitoring system over the last few years that they claim enables the company to track several hundred data points on environmental and social performance indicators.

Even more important than just publishing the numbers, the process of starting to measure performance opens new routes for these companies to begin managing performance more systematically. Further, many of the leading companies are also using international guidelines and standards as an opportunity to learn about the range of sustainability issues that are shaping markets around the world—including markets that they hope to enter.

Second, reporting is placing many aspects of Chinese company performance into a format where they can be discussed for the first time. In the past it was impossible to engage Chinese companies on their performance simply because stakeholders did not know where to start and how to gauge what was and was not happening. Transparency will create the opportunity to create routes of engagement and feedback between companies, communities, and other groups. For example, some international socially responsible investment (SRI) investors have now begun to directly engage Chinese companies on their sustainability performance.

WHERE IS IT GOING?

The key question, of course, is where CSR in China is headed and what impact it will have on how companies approach doing business. The answer to this question will play out over the next ten years. China clearly has reached a tipping point in its development path where there is now a growing consensus among policymakers and some of the more progressive Chinese businesses that environmental impacts associated with development must be addressed. There does not appear yet to be consensus on how to do this, but the visible shifts in policy statements and the business community show that the process is starting.

As Chinese business grapples with its role in this equation, it will be important to engage them in a constructive manner and bring them into a wider international debate. Environmental problems cross national boundaries and, in some cases, know no national boundaries. Solving challenges like biodiversity loss and global warming will require coordination across regions, production chains, and stakeholder groups.

"As Chinese business grapples with its role… it will be important to engage them in a constructive manner and bring them into a wider international debate."

Chinese enterprises are becoming increasingly active in the international networks, which is an encouraging sign and essential step. Over the last 18 months, more than 100 Chinese companies have signed the Global Compact and at least a dozen report according to the Global Reporting Initiative (GRI). For CSR tools and standards to be truly global, they do need to be both applicable and used in China and to have active involvement from Chinese companies in their governance and development. The alternative of a patchwork of national standards won't result in the coordinated efforts that are needed to meet the sustainability challenge.

Supply chain engagement will continue in any scenario. Several nongovernmental organizations (e.g., World Environment Center, Business for Social Responsibility, and Institute for Sustainable Communities) are working on greening supply chain projects with some Chinese companies that not only aim to help build better capacity to adopt cleaner production processes, but also hope to promote better transparency of companies vis-à-vis local communities. Similarly, NGOs such as Forestry Stewardship Council, Forest Trends, and WWF-China are working with various government, timber companies, paper industries, and NGO stakeholders in China to promote sustainable forestry certification. However, the question is what else will happen in the space alongside these supply chain initiatives as Chinese companies begin to take more of a leadership role in the area of CSR?

FINAL THOUGHTS

While there are positive signs that the Chinese government and business sectors are taking CSR

more seriously, it also should not be taken for granted that a wave of corporate environmental and social responsibility will sweep across China and transform business practices and production chains. There are positive steps from leaders, but there are also a staggering number of companies in China (and other countries) that are not interested in a sustainability agenda. However, the opportunity is emerging to engage with Chinese industry domestically and internationally in a manner that has not existed before. The interest exists and now it is up to all parties interested to make the most of it.

Sean Gilbert is a Director at the Global Reporting Initiative, which is the most widely used global guideline for sustainability reporting. In addition to his current involvement with China at GRI, he previously did environmental consulting based out of Taiwan for seven years. He can be reached at gilbert@globalreporting.org or gilbert.sean@gmail.com. This article reflects his personal views and experience.

NOTES

1. Report on Ecological Footprint in China, CCICED-WWF can be downloaded here: http://www.footprintnetwork.org/en/index.php/blog/af/new_report_examines_chinas_fast_growing_footprint.

2. The Global Reporting Initiative (GRI) is a large multi-stakeholder network of thousands of experts, in dozens of countries worldwide that has developed the world's most widely used sustainability reporting framework. The principles and indicators set out in this framework enables organizations to measure and report their economic, environmental, and social performance. For more information see: http://www.globalreporting.org.

3. The Carbon Disclosure Project is a nonprofit organization that encourages private and public sector organisations to measure, manage, and reduce CO_2 emissions. The GHG Protocol is is an online accounting tool for businesses to quantify, and manage greenhouse gas emissions.

SPOTLIGHT

Securing Land Rights for China's Poor Farmers: The Rural Development Institute

By Zhu Keliang, Ping Li, and Radha Friedman

INSECURE LAND AND PEOPLE

Cao Fenping and his wife have spent their lives farming turnips by hand in Tangzhuang Village, Anhui Province. At 65, they yearn for security. But for decades, Cao and his wife have been subjected to the government's periodic "land readjustments." Every 3 to 5 years, the land they farmed was "readjusted" amongst other villagers. They never knew where or how far away from home the new land would be, or in what condition the land would be in when they got there. Without any assurance in keeping the same plots of land, Cao and his family did not want to invest the little money they had in irrigation or organic fertilizers to more sustainably farm their land.

PROPERTY RIGHTS IN CHINA

China's 210 million agricultural households represent one out of every three farm families on the planet, and comprise nearly two-thirds of China's population. For these 700 million people who depend on the land for their livelihoods, secure rights to the land are crucial.

Unfortunately, China's rapid urbanization, economic growth, and population migration are causing millions of farmers to face overwhelming threats to their land rights and livelihoods. Whether through state expropriation or so-called "land readjustments," these land grabs weaken the land rights of farmers, inhibiting them from making long-term investments in their land.

Faced with the constant threat of losing their land, farmers are more likely to plant short-term cash crops and to use pesticides, decreasing the long-term productivity of the soil and the nutritional benefits of the crops. Others may choose to migrate to cities, adding to the demand for converting agricultural land into urban development. Weak land rights turn properties into sitting ducks for local governments, which are increasingly seizing land for nonagricultural purposes and lucrative resale as the industrial economy expands. Land is now the primary source of unrest in China, leading to over 87,000 "massive rural incidents" in 2005, predominantly related to land seizures.

SECURE LAND RIGHTS PROVIDE INCENTIVE TO INVEST IN THE LAND

It is easy to understand why only a minority of Chinese farmers have made long-term productivity-enhancing investments—such as installing irrigation, planting trees or constructing greenhouses—all of which promote environmental stewardship and improve agricultural productivity, income, and wealth. Guaranteeing China's rural poor with secure land rights has a variety of important benefits:

- Providing incentives to invest in the land;
- Increasing the value of farmers' land assets;
- Increasing agricultural production;
- Encouraging organic farming;
- Promoting economic freedom and independence;
- Reducing urban migration; and,
- Promoting better stewardship of the land.

STRENGTHENING LAND RIGHTS FOR 700 MILLION CHINESE

Since 1987, the Rural Development Institute (RDI)—an international nonprofit organization working to secure land rights for the world's poorest—has been working closely with China's central government to strengthen the land rights of rural families and protect them from land seizures. In

For China's rural farmers, secure land rights are crucial. Photo Credit: Rural Development Institute

China, RDI has patiently worked to develop secure, 30-year renewable rights for farmers like Cao and his wife through laws such as China's newly-adopted *Property Rights Law*. With this law, farmers like Cao have meaningful "property rights" for the first time in China's modern history—rights that are long term, sustainable, and marketable. In addition to securing legally recognized private property rights, the law also improves the compensation standards for affected farmers whose land is taken or expropriated by the government for non-agricultural purposes.

THE PERFECT TURNIP

Since receiving these 30-year land rights, Cao and his family have greatly improved their income and security by making investments in their land including:

- Digging three wells;
- Converting 2 *mu* of the household's land into a vegetable garden for the family;
- Installing an electric pump for irrigation;
- Building an organic fertilizer tank for their vegetables; and,
- Switching to organic fertilizer (chicken and goat waste, and sesame oil).

Cao is now able to grow turnips, which sell extremely well. "The demand for my turnips is far greater than my supply!" says Cao. His turnips are highly soil-selective; any artificially-manufactured chemical in the soil would damage the taste of the turnip, and therefore, he only uses organic fertilizer. Though switching to organic fertilizers was a costly investment, it has more than paid off in returns on the sales of his turnips. Today, Cao harvests 5,000 kilos of turnips each year. During non-turnip seasons, he grows other vegetables for local markets. "You have to spend a lot of time and money to nurture the soil before getting into the business," says Cao, "but if the land were reallocated to someone else, your investments would be gone like water."

Today, Cao makes 20,000 Yuan (~$2900) from vegetable farming, and he and his wife and children now feel secure. They are saving for the future and dreaming of their next opportunity. "Perhaps I could pool my money with other farmers in the village to build a larger storage facility, or even a turnip juice processing line!" Cao muses.

LOOKING AHEAD

Partially attributable to gradual reforms to land laws over the last 25 years, the number of Chinese living in poverty fell by 400 million—over 70 percent of

the poverty reduction in the entire world.[1] Yet, although we have seen immense progress, research data from RDI's most recent nationwide surveys (conducted in 1999, 2001, and 2005 in cooperation with Renmin University and Michigan State University) show that only 40 percent of China's rural citizens are actually receiving their full rights. RDI is now working with several levels of the Chinese government in implementing the recent pro-farmer laws including the issuance of land rights certificates and contracts to farmers, grassroots publicity of land laws and policies, establishment of a formal rural land rights registration system, as well as free legal aid and education to farmers.

Secure land rights for farmers like Cao are more relevant than ever. Competition from foreign agricultural producers has intensified as barriers to agricultural imports have dropped with China's entry into the World Trade Organization. After World War II, Japan, South Korea, and Taiwan instituted "land-to-tiller" programs that provided secure land rights to hundreds of millions of farmers, which eventually led to broad-based economic successes in the countryside and drastically reduced rural-urban income gaps. If the government protects the land rights of Chinese farmers as its law requires, China has the opportunity to replicate the amazing economic and social transformations that occurred in rural Japan, South Korea, and Taiwan.

This year marks the 40th anniversary of RDI's work in over 40 countries, helping to secure land rights for over 400 million people. Over those 40 years, RDI has demonstrated that land rights provide global security, as well as, leveraged, sustainable, and generational poverty alleviation. RDI is currently seeking funding to undertake another 17-province survey in the coming months, providing new data from nearly 2,000 rural households in China. For more information about RDI's work, visit www.rdiland.org.

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NOTE

1. Martin Ravallion & Shaohua Chen. (2004). *Understanding China's (Uneven) Progress Against Poverty* (World Bank Policy Research Working Paper 3408).

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