COMMENTARY

Choking on Sand: Regional Cooperation to Mitigate Desertification in China

By W. Chad Futrell

A 1994 *Discover Magazine* article about the arboreal "shelterbelt" being planted along China's "Three Norths" lauded the Chinese government's efforts to combat desertification and the resulting dust and sandstorms (*shachenbao*, literally "sand explosion") ("Great green wall," 1994). Strikingly, the article cautioned how the decline in dust and sandstorms could adversely affect plankton that feed on minerals deposited by such storms. Given the frequency and intensity of China's dust and sand storms over the past few years, it is safe to say that the article's praise and concern were both misplaced. Though there have been improvements in some areas, desertification has accelerated in the 18 provinces prone to this form of land degradation, affecting over 2.6 million km^2 (27 percent of China's total territory) by the end of 2004. These wide swaths of land face a variety of challenges, but all suffer from a lack of water and sound management.

The dust storms originate in the arid and semi-arid regions of China and Mongolia before moving towards China's heavily populated east coast. Powerful storms carry sand over the Korean Peninsula and Japan, where they are referred to as "yellow sand" (*hwangsa* and *kosa,* respectively). Particularly strong dust storms from China can hit North America within a week, sometimes even obscuring visibility in the Grand Canyon. Though the sand storms have always had economic impacts, the fine sand is now picking up pollutants as it travels through China's industrial areas, expanding the list of health concerns from eye and throat irritation to asthma, increased risk of stroke, heart attack, and cancer. Regional governments, scientists, and nongovernmental organizations (NGOs) are now working together to understand and mitigate desertification and the damaging dust storms.

HISTORY OF DESERTIFICATION AND DUST STORMS

Desertification and dust storms in China are not new phenomena. Indeed, Chinese scholars reported the first major dust storm in 1150 B.C. during the Shang Dynasty (Chon, 1994), while Korean scholars first recorded "dust falling like rain" in 174 A.D. (Chun, 2003). Within China, strong storms were sometimes seen as a bad omen; a sign that rulers had lost the "mandate of heaven." The number of reported dust and sand storms in China, Korea, and Japan increased from the 15th century onwards as climate changes and continual population growth along the Silk Road increased desertification. Desertification markedly accelerated after the 1940s as Han Chinese farmers moved into areas previously dominated by ethnic minority herders, often tripling the population within a few decades.

The degradation of fragile grasslands in northern China has been significant. From the 1950s to 1975, desertified areas expanded by 1,560 km^2 a year, accelerating to 2,100 km^2 a year from 1975 to 1987, and finally 3,600 km^2 a year from 1987 to 2000 (Wang, et al., 2003). Wind erosion is the most widespread cause of desertification, affecting 70 percent of the desertified land in all 13 provinces in China's northeast, north, and northwest. Water erosion is another major cause, especially along stretches of the Yellow River on the Loess Plateau, while the freezing and thawing process in the alpine zones of the Qinghai-Tibet Plateau also intensifies desertification. All of these natural causes are exacerbated by human activities. The chief anthropogenic causes of desertification, which strip the land of its vegetative cover and/or use already scarce water resources, include over-cutting for firewood (32 percent of

total anthropogenic desertification); overgrazing (28 percent); over-cultivation (25 percent); and the construction of industrial projects such as mines and oil fields (9 percent) (Wang, et al., 2003).[1]

China experienced, on average, 5 strong dust and sand storms per year in the 1950s, 8 per year in the 1960s, 13 per year in the 1970s, 14 per year in the 1980s, and 23 per year in the 1990s (Wang, et al., 2003). South Korea, on the other hand, recorded a large number of dust and sand storms from 1935 to 1945, after which there were relatively few occurrences until the 1980s. Since then, the number of days of dust and sand storms in South Korea has increased rapidly, from less than 4 days a year in the 1980s, to over 6 days a year in the 1990s, and more than 12 days a year since 2000 (Kang, 2004). Japan averaged around 20 days of dust and sand storms a year from the 1970s to the 1990s, with a sharp increase to 40 days a year from 2000 onwards (Yamamota, 2007). Although the exact rate of change varies among these three countries, all have seen a dramatic increase in the number of dust and sand storms per year over the past several decades.

The vast difference in the number of observed dust and sand storm events among these three countries is due in part to the different ways each measures such storms, with China focusing on wind speed and visibility, while South Korea and Japan emphasize sand particle size. However, the discrepancy in frequency is attributed mainly to the different paths China's dust storms travel. Dust and sand storms originating in the grasslands and cultivated fields of Inner Mongolia usually travel eastwards, but sometimes move southwards first and then eastwards, therefore spending an extended period of time in China. Likewise, dust that originates in China's northwest travels southwards first and then eastwards, passing over Taipei rather than Beijing and Okinawa rather than Seoul. Finally, dust storms originating in the northeast may not hit Beijing but cause serious problems for the Koreas and Japan. Thus, Chinese scientists correctly predicted fewer spring dust storms in 2007 while Korean scientists correctly predicted a very bad spring.

Signs of change on the grasslands for Mongolian herders: motorcycles and brick houses with solar panels and satellite dishes. Photo Credit: W. Chad Futrell

The origins of these storms are important to understand because the makeup of dust and sand varies by location. Sand storms tend to pick up salty, fine soil found in dry lake and riverbeds, thus highly sandy deserts such as the Taklimakan are a source of bigger storms than the stony Gobi. Furthermore, dust and sand storms born on the Loess Plateau carry the same fine soil that gives the Yellow River its name. These differences are important in determining sand storm "hotspots," as well as where the dust is eventually deposited. On average, 30 percent of the dust and sand lifted airborne is deposited close to its origins, while 50 percent travels as far as China's coast, and 20 percent travels beyond China's borders, with finer, lighter particles traveling the farthest.

ECONOMIC AND HEALTH IMPACTS

In the 1980s and early 1990s, desertification cost China at least $6.5 billion a year in direct economic losses (Zhu, 1994), a number that has since risen to $7 billion a year (Wang, 2007). The economic and health costs of dust and sand storms vary greatly depending on wind speed and particulate density. For example, a particularly strong sandstorm in 1993 killed 85 people and 120,000 animals while destroying almost 4,500 houses and 400,000 hectares of crops in Xinjiang, Gansu, Inner Mongolia, and Ningxia provinces (Asia Development Bank, 2005). The direct economic costs of that one storm were more than 550 million Yuan ($72 million) in China alone. As dust and sand storms became more prevalent in the late 1990s, electronics firms in Korea and Japan began to worry about the fine particles infiltrating semiconductor factories. Powerful storms such as those in 1993, 2002, and 2006 can also shutdown airports and schools. South Korean scientists estimated their country suffered $4.6 billion in sandstorm-related losses in 2002, equivalent to 0.8 percent of the country's GDP (Kang, 2004).

The economic costs of dust and sand storms, however, pale in comparison to the confirmed and

The power lines that came in 2006 signal imminent changes for this Mongolian herder. Photo Credit: W. Chad Futrell

potential health risks. The most common health impact associated with these storms is increased incidence of eye, nose, and throat irritation, along with asthma. Scientists are becoming increasingly concerned, however, by the long-term damage caused by inhaling the fine quartz dust. While breathing in silica-rich quartz particles smaller than 10 micrometers (μm) is dangerous, those smaller than 2 μm have the greatest impact on human health because they penetrate deep within the tiniest passages of the lungs. A study in 1993 found that over 21 percent of the residents over 40 years old in a desert area of Gansu Province had pneumoconiosis, a non-industrial version of silicosis, putting them at greater risk of tuberculosis, heart disease, and lung cancer (Xu et al., 1993).

Scientists are even more concerned about the cocktail of pollutants that are increasingly attached to the dust particles. First, the fungi, viruses, bacteria, pesticides, and fertilizers already present in the soil are picked up and carried along with the dust and sand. Then the dust particles pick up pollution as they pass over industrialized areas, including sulfur, lead, cadmium, arsenic, iron, and manganese. Korean and Japanese scientists have studied the concentration levels of these and other metals before, during, and after dust and sand storms from China, finding concentration levels dozens of times higher than normal. Korean scientists now maintain that dust and sand storms raise mortality rates from cardiovascular and respiratory causes, and may even damage human DNA through oxidative damage (Kwon, 2004), while Taiwanese scientists have linked dust and sand storms with increased incidences of stroke (Yang, Chen, Chiu, & Goggins, 2005).

NATIONAL AND INTERNATIONAL GOVERNMENT EFFORTS

Given the substantial economic losses and health risks caused by dust and sand storms, it is not surprising that the Chinese government has been working to reverse desertification for almost thirty years. Starting in 1978 with the "Three Norths" Shelterbelt Program mentioned in the *Discover* article, Chinese national, provincial, and local governments have spent billions of dollars on tree-planting and other soil stabilization campaigns.[2] These efforts have met with mixed success, however, suffering from inadequate funding and poor implementation. Some of the overarching problems include planting tree species not suitable for local ecosystems, poor site selection, and insufficient care of trees. This has led not simply to very low tree survival rates, but in some cases planting efforts have actually made the surrounding area drier, lowering water tables even further. The central government also passed a number of laws, including the Law on Combating Desertification Prevention and Control in 2001. However, like other environmental legislation, a lack of specificity about implementation limits its effectiveness.

The World Bank has supported rural poverty programs that have included extensive grassland and soil stabilization initiatives. Most notable is the Loess Plateau Watershed Rehabilitation Project where, since 1994, the World Bank has been working with communities and local governments in the upper and middle parts of the drainage basin of the Yellow River, one of the most eroded places on earth.

The increasing severity of sand storms has sparked unprecedented levels of environmental cooperation within the region. Not only have dust storms been one of the central topics of the annual Tripartite Environment Ministers Meeting (China, Japan, and South Korea) since 1999, these countries are working with Mongolia and the Asia Development Bank to establish a regional network of observation stations to share data on the origins and paths of dust and sand storms (ADB, 2005). Japan has focused an enormous amount of money on desertification in China, spending around $375 million in 2003 and 2004 alone, while South Korea has provided over $10 million since 2001 to fund efforts to plant trees and shrubs in desertified areas.

EFFORTS BY JAPANESE AND KOREAN NGOS

Though environmental ministries and their related research centers are increasingly working together to study desertification and sand storms, NGOs from Japan and Korea also have been working with local groups in China since the 1990s to both alleviate poverty and prevent desertification. Through this work, many of these NGOs are exploring the ecological, political, economic, and cultural drivers of desertification in order to devise area-appropriate solutions. This attention to the specific conditions of various locations is markedly different from the traditional large-scale government campaigns, such as the "great green wall," which planted the same species of trees in regions with markedly different ecological and socio-economic conditions. Some of the most noteworthy NGOs include:

- *Japan's Green Earth Network* (GEN) has been working around Datong, Shanxi Province since 1992 when its founder, Kunio Takami, began spending over three months a year on the Loess Plateau. Recognizing the need for an environmentally motivated project to work with the local government and address the needs of the local residents, GEN focused on methods that would both generate income and protect the fragile soils around Datong. After experimentation, Takami discovered promise in apricot trees, which are resistant to drought and farmers could sell the fruit and earn 10,000 Yuan ($1,300) annually, compared to 2,000 Yuan ($260) for other crops (Shi, 2007). Over the last 15 years, GEN raised almost $3 million and recruited almost 2,500 Japanese volunteers to help tens of thousands of local people plant over 17 million apricot and pine trees.

- *Organization for Industrial, Spiritual and Cultural Advancement International* (OISCA)—another Japanese NGO—has been conducting afforestation programs along the Yangtze River and in Inner Mongolia since 2000. OISCA established a center for technical cooperation with Shanghai's Jiaotong University in 2002 and founded the Alashan Desert Ecological Research and Training Center in Inner Mongolia in 2006 (Efird, 2007).

- South Korea's *Northeast Asian Forest Forum* (NEAFF) was established in 1998 by former forestry officials and scientists, and held its first international seminar on desertification in 1999. NEAFF has worked with forestry bureau officials to carry out reforestation projects in Shandong Province and Inner Mongolia. NEAFF also has worked with Korea's Forestry Service and China's Forestry Bureau to hold 2 to 3 conferences a year for scientists and government officials since 1999.

- *The Yuhan-Kimberly Corporation of Korea*, a company focusing on paper hygiene projects, initiated the "Keep Korea Green" program over 20 years ago. Its path-setting environmental CSR programs have long-funded a number of NGOs and "forestry and friendship" projects, including those of NEAFF and the Future Forests, Forests for Peace, and School Yard Forest movements.

- *The Korean Federation for Environmental Movement* (KFEM), the largest and most prominent environmental NGO in South Korea, has been working with the Chinese NGOs *Friends of Nature* and *Echoing Steppe* since 2003. They have organized a number of educational exchange programs and fieldtrips for Korean and Chinese high school and university students. KFEM also has hosted annual meetings in China and Korea to help NGOs network domestically and internationally on desertification and other regional environmental issues. Feeling that the emphasis on trees has been misplaced, KFEM and their Chinese partners have been co-managing hybrid grass test sites with local herders and farmers in 4 locations in Jilin Province and Inner Mongolia. Finally, KFEM has helped Korean reporters and documentary filmmakers come to China in order to raise awareness of the economic and cultural issues that lead to desertification.

BUILDING A COMMUNITY

Scientists have made great strides in understanding the causes of desertification, along with the biogeochemistry and health effects of the dust and sand storms plaguing China and the region. The economic and health impacts of these storms have sparked governments in the region to prioritize investments and projects aimed to mitigate desertification. While smaller in scale, NGO projects in the region are coming to understand the political, economic, and cultural roots of desertification. Greater government

attention and support of these grassroots initiatives could help mitigate desertification and dust and sand storms, as well as build a stronger environmental community in Northeast Asia.

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NOTES

1. See the China Environment Health Project Research Brief by Linden Ellis for further information on causes of desertification: http://www.wilsoncenter.org/index.cfm?topic_id=1421&fuseaction=topics.item&news_id=231756.

2. See Yin, Xu, Li, & Liu (2005) for an extensive review of these efforts.

FEATURE BOX

Driving into the Desert of Sand—Circle of Blue

By Jennifer L. Turner

The grasslands of northern China are dying, turning into mini-deserts that grow and connect, forming oceans of sand. And just as oceans produce hurricanes, the deserts of China and Mongolia are increasingly producing dust and sandstorms. These sandstorms have long plagued China's northeast, north, and north, but now they are gaining international attention as sandstorms blanket the Korean Peninsula and Japan every spring. The number of sandstorms has increased in frequency and intensity over the past decade. Within and beyond China these sandstorms force the closure of schools, airports, and factories and have caused billions of dollars in economic losses and pose serious health hazards.

The above paragraph captures the problem addressed in a new multi-media web-based collection of stories that the China Environment Forum (CEF) designed and produced in partnership with Circle of Blue—a network of media professionals, nongovernmental organizations (NGOs), and researchers seeking to focus attention on global freshwater problems. In August 2007, CEF partnered with Circle of Blue to assemble a group of desertification experts and photographers to take a five-day car ride from Beijing into eastern Inner Mongolia. On their drive into the ocean of sand, they gathered stories, photos, and video to put a human face on the impact of China's growing desertification crisis.

Central to the success of the trip was activist Chen Jiqun from the NGO Echoing Steppe, who for years has been advocating better awareness of the plight of Mongolians suffering from relentless desertification in Inner Mongolia. Chad Futrell brought his knowledge and years of experience researching China's policies and programs on desertification to explore the drivers of increasingly harsh sand storms. Getty photographer Palani Mohan and Circle of Blue videographer Eric Daigh captured images—both the stunning and heartbreaking—of how the dry environment is challenging many citizens in Inner Mongolia. CEF and Circle of Blue have melded Chad's story with images from Palani and Eric onto the website: www.circleofblue.org.

circle of blue

The story posted on Circle of Blue's website explores many of the political inequities and environmental complexities behind water scarcity, but also highlights some relatively unknown challenges stemming from mining and the trend of dirty industries moving to the grasslands under China's "Go West Campaign." An excerpt of one of Chad's poignant vignettes is below.

TAKING A STAND TO PROTECT THE GRASSLANDS

"I want my sons and other herders to know that they can stand up to people destroying the grasslands," reflects Damulinzabu as he looks out over the inky black pond that abuts his grasslands. Although Damulinzabu and his two co-plaintiffs won their legal case against Dianhua Paper Mill in 2004, the noxious odors from the cesspool still give him and his wife headaches and nausea. The paper mill has already left Jirigalanggazha village, and Damulinzabu will soon follow. "We can't drink the water, and our sheep still can't put on weight, so how could we stay?" He has used the money from the legal settlement to lease some land outside his village, though it cannot compare with the land he has been forced to leave. "These grasslands were some of

A Mongolian herder sifts through sand where the three-meter deep Arxiaot Lake stood a mere five years ago. Photo Credit: Palani Mohan (Getty Images) for Circle of Blue.

the best in the region. We have a lot of water, which is why that paper mill wanted to come here. Now the water is ruined."

The Dianhua Paper Mill, originally located in Hebei Province just outside of Beijing, was forced to close in 1999 because it was producing too much water pollution. Rather than pay for an expensive water filtering and treatment system, the owner decided to relocate the factory to an area more "amenable" to polluting industries. The Dianhua Mill thus moved about 500 miles north of Beijing to Jirigalanggazha Village, on the relatively water-rich Wuzhumuqin Grasslands. The county government, for its part, was looking for a company to occupy the building originally used by the Dongwu Horse Meat Processing Factory, which had gone bankrupt. The county attracted the mill by providing the empty building and land that had originally belonged to 18 Mongol herders. The county government also promised to return any income taxes to the mill for the first seven years of its operation, and charge very low water and wastewater fees.

As is often the case in China, the paper mill started production in March 2000 without having undergone any kind of environmental evaluation. The mill dug out a 640-acre area to serve as its wastewater pond, and began discharging 2.5 million tons of untreated wastewater into the pool every year. No measures were made to treat the water or to prevent the wastewater from seeping into the ground and aquifer below. Herders living around the mill and its wastewater pond began complaining of headaches, dizziness, and nausea from the noxious odors almost immediately. Not long after the mill began operating grass around the pond began dying, a sign that the wastewater was already seeping into the groundwater. Damulinzabu and other herders filed their first petition to local village Communist Party members and cadres within a few months of the mill's opening, requesting a return of the land, compensation for their losses, and that measures are taken to protect the water supply and grasslands.

After three years of fruitless appeals to the government, Damulinzabu led a group of seven herders in August 2002 in filing a lawsuit against the Dianhua Paper Mill with the help of a Beijing-based law firm. Four of the herders dropped out after considerable pressure from the local government and the loss of legal rights to their land. The Intermediate People's Court of Xilingele Prefecture accepted the case and ruled in favor of the plaintiffs—the first time Mongolian herders had successfully pressed such a case.

To read more on water and desertification in Inner Mongolia along other water stories from around the world please visit: www.circleofblue.org.

COMMENTARY

Tackling Cross-border Air Quality in Southern China

By Christine Loh

It is time to clean the air that the 60 million inhabitants of the Pearl River Delta (PRD) region breathe every day. Guangdong's industrialization and urbanization—driven largely by Hong Kong capital—has had a significant impact on the environment of the whole PRD region. In view of the close economic relationship between Hong Kong and the PRD, the question is whether these two governments can collaborate to meet these challenges to insure their future competitiveness in a world in which energy-efficient, low-emissions, and low-carbon economies will be rewarded.

SMOGGY DEVELOPMENT IN THE PRD

As a hyper-growth region, Hong Kong and the PRD present enormous ecological and environmental challenges, for it is now one of the world's largest export-manufacturing bases. The region started as a center for the production of light industrial products in the 1980s, then expanded to highly polluting heavy industries, particularly automobile and petrochemical production. Over the past two decades, several cities in the PRD have recorded rapid population growth as rural migrants flocked to them to find better-paying jobs in manufacturing. The population size of the PRD area has increased dramatically from 20 million in 1982 to 45.5 million in 2005 (National Bureau of Statistics, 1995 & 2005). While the concentration of light industries in such a small area has created significant pollution, the later arrival of heavy industries is leading to even greater energy consumption and polluting emissions, including climate changing greenhouse gases. Moreover, to support the expansion of the export sector, port and logistic facilities in Guangdong and elsewhere in southern China have been greatly expanded, often with Hong Kong capital and management.

Air quality in Hong Kong and the PRD has deteriorated steadily since the early 1980s. In 1998, the Hong Kong government acknowledged the seriousness of the problem, emphasizing a duel strategy of cleaning up locally and cooperating with Guangdong to improve air quality. In October 1998, the Chief Executive Tung Chee Hwa announced that Hong Kong and Guangdong would initiate a study of the air quality in the region, with the aim of developing joint improvement measures from 2000 onward (Tung, 1998).

In 2002, the jointly sponsored *Study of Air Quality in the Pearl River Delta Region* between the Hong Kong and Guangdong authorities was published, and produced the first emissions inventory for the region (CH2MHill, 2002). The study revealed that 80 percent of air pollution emissions in the region originated in Guangdong, while 20 percent were from Hong Kong. As a result of the study's recommendations, both governments agreed to reduce on a best-effort basis by 2010 the regional emissions of SO_2, NO_x, respirable suspended particulates (RSP) and volatile organic compounds (VOCs) by 40%, 20%, 55% and 55%, respectively (using 1997 as a base year) (HKSAR Government, 2002). While Hong Kong environmental nongovernmental organizations (ENGOs) were critical because the targets were only voluntary, it was the first time that Hong Kong and Guangdong agreed on specific targets, which were announced at the highest level on both sides making them well-intentioned and important political statements.

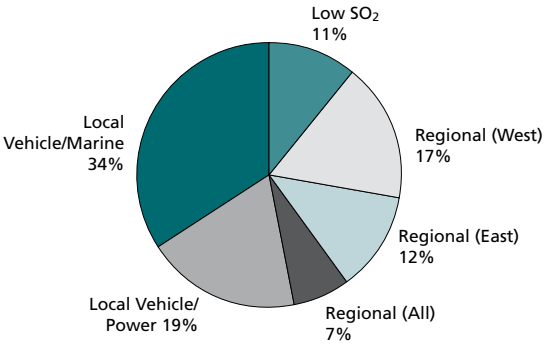
MOVING FROM STUDIES TO ACTION

In December 2003, the two sides drew up the PRD Regional Air Quality Management Plan, with the details of pollution control measures to be implemented in Hong Kong and Guangdong in order to meet the set targets (ETWB, 2004). The PRD Air Quality Management and Monitoring Special Panel formed under the Joint Working Group for Sustainable Development and Environment Protection (hereafter JWG) and is responsible for monitoring the PRD Regional Air Quality Management Plan (HKEPD, 2005a and b). It was expected that if these targets were achieved, then Guangdong's air quality would improve, and Hong Kong would be able to meet its Air Quality Objectives. It took the two governments an additional three years to implement a Joint Regional Air Quality Monitoring Network, which commenced operations in November 2005 (HKEPD, 2005). In 2005, the Hong Kong and Guangdong Energy Efficiency and Cleaner Production Special Panel was established under the JWG to promote energy efficiency and cleaner production initiatives in the PRD to improve regional air quality.

ACTIVISTS, SCIENTISTS, AND BUSINESSES STEP IN

Since the late 1990s, public concern in Hong Kong about air quality has grown substantially[1] and continues to present a problem to employers trying to attract global-knowledge workers to stay in or relocate to Hong Kong (Merrill Lynch, 2006). While Hong Kong ENGOs have complained about air quality for many years, there has been an upsurge of their activity since 2000. Today, ENGOs in partnership with local scientists not only highlight air problems, but also provide new data and policy solutions that counter or go beyond those of the Hong Kong government. The research and policy capacity of this active ENGO and scientific community focusing on air issues has grown dramatically, and the severity of the problem has attracted new private sector funding to assist them in upgrading the quality of their work.[2] The ENGO sector in Hong Kong has also increased their cross-boundary collaboration on air quality issues, notably helping to connect Hong Kong and PRD scientists. This ENGO work, coupled with government-funded studies, has markedly increased air quality management knowledge in the PRD.

FIGURE 1. Sources of Air Pollution Impacting Hong Kong in 2006 (Average Percentage of Days Each Month)



The percentages labeled Regional East, West, or All signify the source of pollution from the Pearl River Delta that was impacting Hong Kong (on average each month) in 2006. When conditions are Regional All, pollution from the PRD is the primary type of pollution over all of the HKSAR. Low pollution denotes the percentage of days (on average) each month that $S0_2$ (sulphur dioxide) concentration was below 20 ug/m^3. Local pollution is divided into emissions from vehicles and power generation and vehicles and marine sources.

The biggest contribution by the Hong Kong scientific and ENGO communities is the discovery that the emissions picture for the PRD is far more complex than what the government-led emission inventory showed. For example, in the winter months, pollution from the region affects Hong Kong more severely, but in the summer months, the dominant polluting emissions are from Hong Kong's own sources. Thus, in terms of time affected, there were 192 days in 2006 (53 percent) when the dominant emissions affecting Hong Kong were locally generated. (See Figure 1).

ENGOs researcher verified that Hong Kong needs to work harder still to lower the emissions from its own transportation, power generation and marine sectors, as well as intensifying cooperation with the Guangdong authorities to fight regionally generated pollution (Lau et al., 2007).

To date, the Hong Kong government has focused primarily on power generation and some aspects of vehicle emissions, which ENGOs in Hong Kong argue is insufficient. While the government looked at total tonnage emitted and deemed power plants as the biggest emitter by far, local ENGOs argue that in public health terms, the emissions from vehicles

and marine sources are equally important, as those emissions affect high population areas in many parts of the city (Trumbull, 2007).

TRANSPARENT AND RELIABLE DATA

The Pearl River Delta Regional Air Quality Monitoring Network has been providing data for the reporting of the Regional Air Quality Index on SO_2, NO_x, RSP, and ozone (O_3) that is posted daily on the Internet.[3] The network has monitoring stations in both the PRD and Hong Kong with the Guangdong Provincial Environmental Protection Monitoring Center and the Hong Kong Environment Protection Department (HKEPD) responsible for the coordination, management and operation of the monitoring stations of their respective side of the border. The governments believe the monitoring results will help both sides carry out scientific analysis of the air quality trends in the PRD. Moreover, the governments expect they will be able to assess the impact and effectiveness of pollution control measures after the monitoring network records more data.

The importance of the monitoring network, the Regional Air Quality Index (RAQI) and Guangdong's release of data cannot be overemphasized. It is the first of its kind in China, providing reasonably reliable scientific data not only to Guangdong and Hong Kong, but also to the national authorities so that all concerned stakeholders can gain deeper understanding into emission profiles and trends in a rapidly industrializing and urbanizing part of the nation. The learning from this cooperation could be scaled up in other regions and eventually nationwide.

> **"The biggest contribution by Hong Kong scientific and ENGO communities is the discovery that the emissions picture for the PRD is far more complex than what the government-led emission inventory showed.**

Moreover, the organization of the network and index to ensure data integrity and reliability represents an important aspect to capacity building in air quality management for Guangdong and Hong Kong. The Hong Kong partnership serves as quality assurance of the data. In the long term, the two sides must devise a new way to manage air quality together with a new joint regulatory framework backed by law.

With China's state secrecy culture, including the non-release of much environmental[4] and public health data, Guangdong's data is already enabling air quality scientists all around the country and internationally to learn more about China's pollution problems, which can only help the diffusion of ideas for solutions in the future.

CATALYZING CHANGES IN GUANGDONG AND HONG KONG

The joint Guangdong and Hong Kong targets, while voluntary, have had a positive impact on catalyzing improvements. The Guangdong provincial government has been strengthening its hardware and software to reduce air pollution, including installing flue gas desulphurization equipment in the large coal-fired power plants, using more natural gas for power generation, and striving to speed up the introduction of National III motor vehicle emission standards (on a par with Euro III standards) in PRD cities. In Hong Kong, the government has imposed emission caps on power plants and is adopting new fuels and technology to reduce polluting vehicle emissions; promoting building energy codes; reviewing new Air Quality Objectives (which have not been changed since they were established in 1987) and the long-term strategy on air quality management by 2009 (Tsang, 2007).

New areas of cross-boundary collaboration have also emerged. For example, the Ministry of Science and Technology granted Guangdong 150 million Yuan in 2007 under China's National High Technology and Development Program (a.k.a. Project 863) to carry out a five-year pilot air pollution and control technology investigation research project focusing on key PRD cities.[5] Guangdong has matched this amount with its own funds, which means there is a total of 300 million Yuan put towards this project. Significantly, Guangdong has invited Hong Kong's participation, although at the time of writing, the Hong Kong government has yet to respond.

With an active civil society in Hong Kong, a free news media, and a legislature that demands officials to account for progress on policy implementation in the open, Hong Kong has a "pull effect" on Guangdong, applying pressure to be accountable even though the agreed target reductions are on a best-effort basis. While much more can and should be done, events over the past ten years represent a series of innovations in regional air quality management that have created the foundation to build upon.

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NOTES

1. Concerns have been shown on both sides of the border. Over 50 percent of 1,528 respondents in the PRD expressed high or comparatively high concern on the air pollution. In addition to those working in the education and government sectors showed the highest concern, 70% to 80% of the remaining respondents ranked air pollution and its impact on health a serious concern. See Civic Exchange and China Development Institute. (2002). *Attitudes on the Environment: A Survey*

on Pearl River Delta Residents, http://www.civic-exchange.org/publications/2002/PRD%20report%20-%20E%20-%20web.doc.

2. In the case of the nonprofit think tank Civic Exchange, funding in recent years has come from new donors in the financial services sector who are finding it hardest to retain and attract global talent as a result of air quality deterioration. Since 2005, a string of international reports about Hong Kong's air pollution has highlighted the impact pollution has had on personnel retention and hiring for major international financial firms.

3. For daily readings on the RAQI visit: http://serve.gdepb.gov.cn/raqi/QEng.aspx.

4. In the spring of 2007, China's State Environmental Protection Administration did pass draft regulations on environmental information dissemination, which highlights a new step towards openness on pollution data.

5. The National High Technology Research and Development Program (Project 862) was launched in 1986 with the aim to enhance China's international competitiveness and improve its overall capability in high-tech research and development. There have been many projects done as a part of this program. The program is supervised by the Ministry of Science and Technology, see http://www.863.org.cn/english/annual_report/annual_report_1999.htm. Since 2004, Hong Kong and the Mainland has set-up the Mainland-Hong Kong Science and Technology Cooperation Committee, which is co-chaired by a minister in Hong Kong and the national vice-minister of Science and Technology. During the Committee's 2nd working meeting on 20 April 2006, the Ministry of Science and Technology invited Hong Kong technology experts to participate on expert committees and panels under the program. The pilot air pollution-control technology project includes many sub-projects.

COMMENTARY

Institutionalizing Public Participation in AIDS Governance in China:

Notes from a Unique Meeting for Activists and Grassroots NGOs

By Fengshi Wu

In early December 2006, I had the unique opportunity to attend a meeting of HIV/AIDS grassroots activists in Wuhan. Attendees were primarily representatives from Chinese HIV/AIDS nongovernmental organizations (NGO) and community-based organizations (CBO). They were tasked with designing the rules for electing NGO/CBO representatives for the China Country Coordinating Mechanism (China CCM), which coordinates the funding and projects supported by the Global Fund to Fight AIDS, Tuberculosis (TB), and Malaria (the Global Fund). (See Box 1). In short, the activists came together to decide how to choose their own representatives, who would be part of the governing body overseeing million-dollar HIV/AIDS projects throughout China.

Even on the surface this meeting was unlike the typical government-dominated procedural sessions in Chinese public health politics, for it involved many nongovernmental players. More significant than the diversity of the participants was the goal of the meeting to be a trial in institutionalizing public participation in health policymaking structures. If this trial succeeds, China observers may look back at this little-publicized meeting as a symbolic event in the history of China's AIDS prevention and governance.

BACKGROUND OF AIDS PREVENTION IN CHINA

Over the past five years, the Chinese government has become much more open to international organizations and domestic grassroots groups addressing the problems emerging from AIDS-related policy implementation.

Partially due to the 2003 SARS crisis and the change of public health leadership, AIDS control and prevention in China has entered a dramatically new phase. The Chinese government has not only publicly acknowledged the dreadful situation of AIDS infection in the country, but has also strengthened the institutional capacity of AIDS governance at the central level. The central administrative arm leading AIDS prevention affairs in China has been upgraded to the State Council Committee of AIDS Control and Prevention.[1] Today this committee coordinates 29 state ministries to determine national-level policies, and all provincial governors are on board. Moreover, between 1995 and 2005, China's total national budget for AIDS prevention has increased from 500,000 to 2 billion Yuan.[2]

Meanwhile, international assistance for AIDS prevention in China has increased rapidly since 2000. With support from China-UK HIV/AIDS Prevention and Care Project, the Global Fund, the U.S. President's Emergency Plan for AIDS Relief, and many other agencies, total bilateral and multilateral funding available for China is estimated to have reached $8.1 billion in 2005.[3] International foundations, NGOs, and businesses also have provided significant amounts of financial and human resources to China, including Merck, Ford Foundation, Clinton Foundation, and most recently, the Bill and Melinda Gates Foundation. Internationally funded HIV/AIDS initiatives and projects include nationwide

surveillance and monitoring, cross-departmental policy coordination, medical and clinical research, public education, community-based care programs, treatment delivery, self-help and poverty relief.

THE GLOBAL FUND IN CHINA

The reform of the China CCM for the Global Fund to include representatives from outside the state apparatus is one concrete example of this political opening to grassroots HIV/AIDS activists. In order to obtain financial support from the Global Fund, the Chinese government established its own CCM in 2002. At that time, it was composed mostly of representatives from the central government and UN agencies located in China and focused on supporting TB-related projects. In September 2003, the Global Fund approved the application from China to support work in the area of AIDS for the first time. The following year, China CCM formed a Special Working Group, led by UNAIDS in China, to improve the efficiency of its work and the composition of its members.

As a result, CCM redefined its composition and decreased its members from 54 to 22. It also clarified duties and mechanisms of the CCM Plenary, CCM Secretariat, Principal Recipient and AIDS/TB/Malaria Working Groups. CCM passed its constitution in June 2006, and started electing new members—five are standing members (including the chair); five from the Chinese government; six from the nongovernmental sector; one from the corporate sector; four from multilateral agencies (e.g., World Bank); and one from people living with HIV/AIDS (PLWHA).

Among all the seats for the CCM, the ones allocated to the nongovernmental sector caught the most attention. If fully realized these seats, together with the one seat of PLWHA, would open the door for direct public participation in AIDS governance. However, of the six seats, the CCM constitution designates one for the China Center for Disease Control (China CDC)—a subordinate branch of the State Ministry of Health; one for an international NGO; and three for the traditional mass-based, so called "social mobilization organization" in China (e.g., All-China Women's Federation). Only one seat is reserved for grassroots voluntary- or community-based groups. Under the current political and regulatory context, such groups are often either not formally registered, or registered in a status other than nonprofit. Thus, even if the selection process of the NGO/CBO sector representative went smoothly, the degree and scope of public participation facilitated by the CCM mechanism would remain limited. However, NGO/CBO representatives from throughout China are involved in the nomination process for all six of the non-governmental seats. Thus, the CCM represents an unprecedented attempt to formally include grassroots groups in decision-making and monitoring structures in China's public health structure.

It is also worth mentioning that the Global Fund has continuously accepted AIDS-related project applications from China since 2004. Projects supported by the Global Fund have become an integral part of the overall AIDS prevention effort led by the Chinese government. All the funding is channeled through the CDC at different administrative levels and most project sites are decided in parallel with China's own state-run projects. Moreover, most staff and professionals in charge of Global Fund projects are formerly affiliated with China CDC. Therefore, it is not unreasonable to anticipate that the experience of China CCM integrating NBO/CBO representatives might provide lessons for AIDS governance in China more broadly. In other words, if bringing grassroots participation into the China CCM is successful, CDC-led HIV/AIDS projects might be more willing to open the door to NBO/CBO involvement.

THE WUHAN MEETING: MOVING TOWARDS INSTITUTIONALIZED PUBLIC PARTICIPATION

To implement the decision to include NGO/CBO and PLWHA representatives, China CCM Special Working Groups engaged with NGO/CBO leaders and called for an election in Beijing in April 2006. Some 20 NGO/CBO representatives attended and voted. The election result immediately caused strong reaction from the rest of the NGO/CBO community. Many felt the meeting was rushed and were distrustful of the elected person. Subsequently, an ad hoc working group was formed, and two independent consultants were invited to review the disputed election. In July, a final review was released that acknowledged the result of the April election and provided detailed advice for improving future elections.[4] A new election was soon put on CCM's agenda. Pre-election meetings were organized to involve as many NGOs, CBOs, and PLWHA as

possible at an early stage and to produce a set of procedures and guidelines for the new election. The meeting for NGOs and CBOs was held in Wuhan in December 2006.

A total of 106 grassroots social groups, over 20 HIV/AIDS patients, around 50 observing agencies, and a group of farmers from rural Henan attended the Wuhan meeting.[5] I attended as a member of the Aixin Foundation that was established in Maryland (U.S.) and recently moved its main operations to Beijing.[6] The meeting lasted three days and two nights, during which time I did not take one step out of the hotel where it was held. I spent all possible tea, meal, and nap breaks conversing with various participants; yet, I left the meeting regretting that it was too short to get to know all the participants well.

Grassroots Voices

My roommate was Ms. Guo, an AIDS patient and PLHA group leader from Guizhou Province. She tested HIV positive four years ago after the death of her husband, who doctors suspected had infected her. As is common in rural China, relatives did not take pity on her. On the contrary, they distanced themselves from her and took away her only son. She was deeply depressed when she encountered the staff of China-UK AIDS Prevention and Care Project in Guiyang city. Through the project activities, she learned more about the disease, and more importantly, she learned that she can live with the disease and even help others fight it. Her PLWHA group has created various programs to obtain skills to support their families. At the meeting, Ms. Guo met many other PLWHA groups, and was not shy in discussing with them the meaning of the upcoming China CCM member election.

Loving Source, a Beijing-based NGO devoted to AIDS care programs in rural Henan and AIDS policy advocacy, also participated in the meeting.[7] The organization recently completed a leadership and board member transition—a significant achievement in China where civil society organizations are often created by charismatic leaders and fall apart once that person departs.[8] Its new director, Mr. Cheng Xiangyang, is originally from rural Henan, the heart of the blood contamination scandal and HIV/AIDS spread in north-central China. By working together with activists, researchers, and medical staff from Beijing, San Francisco, and many other places around the world over the past seven years, Cheng has quickly grown into a mature professional activist. He found the Wuhan meeting a timely opportunity to introduce Loving Source's newly modified mission and working plans to peer organizations and international agencies.

During one lunch session, I sat beside the representative from the Beifang Jinde Catholic Social Service Center based in Hebei Province, and we had an animated, enlightening chat.[9] Jinde is a nonprofit Catholic group devoted to providing basic social services to rural communities in north-central China. In the area of AIDS prevention, it has successfully helped a group of HIV/AIDS patients infected by blood transfusion win reasonable compensation in a class action suit against local hospitals. They recently launched their new projects in the Shahe region of Hebei, and hope to replicate some of the effective service and legal strategies used in previous work. Even though the presence of religious groups in social welfare is expanding in China, I was still very impressed by the successful stories from Jinde. I believe their experience can encourage other religious organizations to undertake similar work.

> **"Mistrust and envy abound when… millions of dollars of international assistance suddenly become available to Chinese AIDS NGOs, turning them into competitors before they even know each other.**

There was a group of special participants at the Wuhan meeting not on the official list. They all came from one village in rural Henan, led by Professor Liu of the Henan Social Science Academy. Professor Liu has been conducting research in the village on the impact of HIV/AIDS since 2004. She gradually found her passion searching for resources to help the villagers rebuild their livelihoods and regain hope. She encouraged some of the villagers to come to Wuhan with her, believing this experience would open their eyes and expose them to the current discussion of related policies. Moreover, she

BOX 1. China Country Coordinating Mechanism for the Global Fund Projects (China CCM)

One of the major achievements under the former UN Secretary, Kofi Annan, was the establishment of the Global Fund (www.theglobalfund.org) in 2002 to enhance the global fight against AIDS, tuberculosis and malaria. To date, the Global Fund has committed $7.1 billion in 135 countries to support aggressive interventions against all the three diseases. What distinguishes the Global Fund from other UN affiliated programs is it operates as a financial instrument, not an implementing entity. It prefers applications that reflect national ownership, and emphasizes the need for simplified and rapid grant making.

The Global Fund requires each applicant country to form a coordinating mechanism (CCM) to review applications, and to monitor and guide the implementation of funds and projects approved by the Global Fund. China established its own CCM in 2002. In September 2004, the Global Fund (3rd Round) approved the first grant of $32 million (for 2 years) to China for HIV/AIDS-related projects, and has since continuously provided funds to China each round. For more information see: www.chinaglobalfund.org.

strongly believed that these farmers, direct bearers of the epidemic, need to have their voices heard, and need every opportunity to learn how to express their opinions and raise their concerns in multi-stakeholder forums. Although these villagers were not "officially" invited, I did not notice discomfort or resentment by any of the participants or meeting organizers. They sat around the same table as others, and took part in the discussions.

Bonding

In contrast to the freezing-cold rainy day outside, the meeting rooms were full of heated discussions. After every day's formal sessions, which ended at 9 pm, participants spread into smaller groups on their own and continued their conversations, exchanging information and brainstorming project ideas late into the night.

The Wuhan meeting, first and foremost, provided a long-awaited opportunity for Chinese AIDS prevention activists, grassroots NGOs, and community groups to meet in person and get to know each other. The community is not that large. According to China AIDS Work Directory (http://www.china-aids.org), in 2006 there were only 150 AIDS related quasi-NGOs, grassroots NGOs/CBOs and PLWHA groups in China (compared to the estimated 2,000 registered green groups). These numbers are growing and my research indicates there are over 120 PLWHA groups alone operating across the country in 2007. The HIV/AIDS civil society community surely needed this opportunity, for it has suffered from loss of trust caused by the April 2006 CBO/NGO sector representative election. Meanwhile, new patient mutual-help groups, youth volunteer teams, and NGOs are emerging every day, yet few know where to find peers and leaders for advice. In a sense, the Wuhan gathering was timely for old friends to reconnect, and new activists to learn that they are not fighting alone.

This meeting reminded me, and probably many of my environmentalist friends, of the annual New Year parties that the Friends of Nature (a Beijing-based green NGO) used to host for all environmental NGOs and green groups (when they were not as numerous) in the late 1990s. Many veteran environmentalists in China feel nostalgic for such large gatherings, for they created a sense of belonging for all the involved groups.

DEBATING THE ELECTION GUIDELINES

The Wuhan meeting was not merely a "family reunion." Besides exchanging name cards and chatting, the CBO/NGO representatives were divided into six groups that mixed geographical regions and activism types to design a candidate nomination and election guideline. Over four three-hour sessions, participants engaged in intensive group discussion and debates, went through the drafted election procedures word by word, and put forward many new principles for the election. Such group meetings sometimes were accompa-

nied with shouting that was eventually followed by apologies.

One of the controversies that emerged in my group was a clause concerning candidate eligibility. The question was whether a criminal record should impede one entering the China CCM election ballet. Those who were against this clause argued that leaders of groups for drug users and sex workers might be denied candidacy because they may have previously been drug users or sex workers, and therefore could have been arrested by pubic security agencies. Sometimes HIV/AIDS activists trying to help these marginalized communities are arrested for they are seen as supporting "criminal" activities. Those who supported the clause firmly believed that a CCM member should not only represent the NGO/CBO sector, but also be a good citizen. The discussion was stalemated until one participant stood up and reminded the whole group to be extremely careful with the exact articulation of the clause. The Chinese public's general opinion towards AIDS, PLWHA and the work related to AIDS prevention is still vague. The election guideline ought not to promote social discrimination by indicating that HIV/AIDS patients and activists are somehow related to criminal acts. At last, my group agreed to strike the phrase "criminal record," but to add a statement holding the election committee responsible for reviewing the background and eligibility of the candidates.

In our group, there was a quiet Kazak college student from the Xinjiang Autonomous Region. He and his college friends in Xinjiang University of Medical Science formed their group for AIDS prevention in 2006. When the discussion came down to the issue of dividing the country into several election zones based on geographic location, he finally spoke up in spite of his shyness. His argument was that because NGOs and activism were underdeveloped in minority regions compared with other parts and cities of the country, by only considering geographic-based fairness, minority groups would miss out in the early stage of the election. My peer group members were bewildered upon hearing his point, for this problem had never occurred to them before. Though their daily job is to fight for marginalized people, for example, farmers, women, children and gays, they were not sensitive to the fact that minorities are on the margin of the marginalized. Even though, our group did not come up with a smarter strategy on how to allocate the limited number of candidates to the large number of NGOs/CBOs across the country, except by dividing the vast country into six regions, we did agree to add a line into the election guidance that "special attention needs to be paid to minority representation." However, it is not merely what was put in the guidelines that mattered, but also that the activists tried to listen and acknowledge different opinions.

Beyond networking, the Wuhan meeting created a setting conducive to collective learning that facilitated mutual respect and skills in compromise and collaboration among grassroots activists. The Wuhan meeting gave diverse AIDS-related citizen groups an opportunity to listen to each other, and work together for a common goal through detailed discussions of how to organize the NGO/CBO community, generate candidates, publicize the ballot, set up voting channels, and conduct vote counting. In a sense, they became better acquainted with each other via disagreeing, debating, and eventually reaching an agreement, than had they simply met for a conference describing each of their group's work.

FOLLOW-UPS AND LESSONS TO BE LEARNED: BUILDING TRUST WITHIN A COMPLEX PUBLIC POLICY COMMUNITY

By the end of the Wuhan meeting, participants completed their tasks—drafting a set of binding laws for the election of their own representatives. Most groups found the meeting a worthwhile and meaningful experience. Elections of NGO/CBO and PLWHA were held in March 2007. On 30 March 2007, the 20th Plenary of China CCM officially acknowledged the membership of Wang Xiaoguang (and two non-voting members) representing the CBO/NGO sector and Meng Lin (and two non-voting members) representing people living with AIDS/TB/malaria.

Criticisms of the election still arose. For example, many of the issues raised and statements passed at the Wuhan meeting were not applied in the actual execution of the March election.[10] Observers were also critical about UNAIDS China's arbitrary decision of having the election during the Chinese New Year break, when the whole nation basically shuts down and even some of the election-related websites were not functioning. Many felt that grassroots participation would be more full-fledged, if more pre-election workshops had been held and the

election could have been delayed slightly.[11] Despite these disappointments, the consensus within the AIDS prevention community is that the reform of China CCM has institutionalized public participation in AIDS governance in China.

What further can be drawn from the Wuhan meeting and the NGO/CBO election is that collective learning and trust are crucial for the overall development of the AIDS prevention community. Compared with the environmental, women's rights, and other activist communities mobilized by more or less focused issues or communities, the area of AIDS prevention is distinctive in terms of internal diversity. AIDS-related grassroots groups consist of individuals and groups with extremely different social, economic, and ideological backgrounds. Because of this high level of internal diversity, it is difficult to form a sense of belonging among all AIDS-related groups. Many groups, especially those composed of only PLWHA, see themselves as victims of policy failure, and value compensation and access to treatment over other issues. An urban gay group probably has a dramatically different notion of discrimination and fairness related to AIDS prevention than a rural farmer group who are mostly infected through blood contamination. Good will is not enough for policy-oriented NGOs, often based in Beijing, to form empathy with migrant workers, drug users and sex workers. Mistrust and envy abound when, for example, millions of dollars of international assistance suddenly become available to Chinese AIDS NGOs, turning them into competitors before they even know each other.

The Wuhan meeting gave activists and NGOs a collective experience of getting to know each other, establishing mutual respect, and going through disagreements. Such an intense meeting produced fruitful results, not only paving the way for the first nation-wide election for grassroots activists in the field of AIDS prevention, but also teaching participants the way to form a common voice and to better influence the overall policymaking process in China.

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NOTES

1. In Chinese, National Committee is *Quanguo Weiyuanhui*, and State Council Committee is *Guowuyuan Weiyuanhui*. Usually, in practice, the latter is ranked higher, and endowed with more resources. The establishment of the latter is an indicator of stronger political will from the top leaders in the related issue area.

2. Bates Gill & Xiaoqing Lu. (2007). "Demography of HIV/AIDS in China." Center for Strategic International Studies.

3. UNAIDS. (2006). *Report on the Global AIDS Epidemic*.

4. See both "Review of China CCM Elections" (by Bernard Rivers and Qiu Renzong, 26 July 2006), and "Statement by Joel Rehnstrom, UNAIDS China, Chair of the ad hoc working group on the disputed CCM sector group elections" (in August 2006). [Online]. Available: http://www.chinaglobalfund.org.

5. The HIV/AIDS patients' identities were kept unknown throughout the meeting, and therefore the number 20 is estimated based on the author's observation. The farmers from Henan were from different villages. They were not all infected by HIV, but their lives are certainly affected by the diseases. They neither established their own organizations yet nor understood the purpose of the Wuhan meeting, but they still arrived at the meeting hoping to voice their opinions and learn what to do to better the situation back home from this occasion.

6. For more information, please see: http://www.aixinfund.org

7. For more information, please see: http://www.chain.net.cn/qshcy/fzfzz/bjayxxzxzx/

8. Loving Source's founding person, Hu Jia, and its first executive director, Zeng Jinyan, have both become too politically sensitive to remain affiliated with the organization.

9. For more information, please see: http://www.jinde.org.

10. Interview with Prof. Li Dun, Tsinghua University, in Beijing, August 2007. Prof. Li was invited by the election committee to run three regional pre-election workshops to prepare NGOs/CBOs to run their election campaigns and voting, in Kunming, Xi'an and Beijing. He is also the author of the executive review of the whole election commissioned by the UNAIDS China office.

11. Multiple interviews with researchers and experts in Beijing, August 2007.

FEATURE BOX

Environmental Health Perspectives: A Portal to Environmental Health Information in China

By Tanya Tillett

For more than a decade, *Environmental Health Perspectives* (*EHP*) has published news and research chronicling ongoing and emerging environmental health issues affecting China and its people.

Arsenic exposure poses a major health issue in China that *EHP* documented through a series of research articles over the last year. The July 2007 issue of EHP included a study of metallothionein as a biomarker for individual sensitivity to metal toxicity in arsenicosis patients in Guizhou Province (Liu et al., 115:1101–1106); the May 2007 issue includes an assessment of the cardiac effects of arsenic (Mumford et al., 115:690–694); and, in the April 2007 issue, a collection of five papers examines arsenic occurrence and health effects throughout China (115:636–662). In June 2006, EHP published research indicating a link between oxidative stress and arsenic exposure in the Ba Men region of western Inner Mongolia (Mo et al., 114:835–841).

EHP has also recently examined the health effects of other elements and environmental pollutants in China. In the February 2006 issue, Chen et al. examined the interaction between selenium and mercury, and noted that selenoproteins may help protect against mercury toxicity, a key issue in the industrial regions of China (114:297–301). In the August 2006 issue, Zhang et al. presented results from a study of the acute effect of ozone on mortality outcomes in Shanghai (114:1227–1232). That same issue examined the relationship between prenatal exposure to polycyclic aromatic hydrocarbons (PAHs) and reduced fetal and child growth in Tongliang (Chongqing), the location of a seasonally operated coal-fired power plant (Tang et al., 114:1297–1300). In another article relating to children's environmental health research, published in

the July 2007 issue, Huo et al. observed that unsafe electronic waste recycling methods may contribute to the elevated blood lead levels in children living in Guiyu (Guangzhou Province) (115:1113–1117).

Over the past year, EHP published research documenting various occupational health effects among Chinese workers. These include altered adduct levels among benzene-exposed workers (Lin et al., 115:28–34); reduced testosterone among phthalate-exposed flooring manufacturers (Pan et al., 114:1643–1648); hearing loss among workers exposed to toluene (a clear organic solvent widely used in various manufacturing industries) (Chang et al., 114:1283–1286); and decreased PON1 gene activity among lead-exposed battery makers and recyclers (Li et al., 114:1233–1236). A June 2007 review by Zhang and Smith (115:848–855) surveyed approximately 200 Chinese- and English-language reports documenting the health effects and exposure characteristics of indoor solid fuel use, a practice used by workers across the industrial spectrum.

"Disseminating the latest environmental health science information to the widest audience possible is one of the primary goals of EHP.

In addition, EHP reported and discussed timely news topics regarding environmental health in China over the past year. News items have addressed lung disease (115:A131), soil contaminants (115:A23), lead in medicinal herbs (114:A344), environmental policy (114:A345), and green buildings (114:A347).

Disseminating the latest environmental health science information to the widest audience possible is one of the primary goals of *EHP*, and, with a population of more than 1 billion, China accounts for a significant portion of this worldwide audience. For the past six years, the journal has published the *EHP Chinese-Language Edition* on a quarterly basis. The *EHP Chinese-Language Edition* consists of news articles and research summaries from the English version that are reprinted in Chinese both in hard copy and online at www.ehponline.org/cehp. Ken Korach, *EHP*'s interim editor-in-chief, says this effort has "allowed Chinese environmental science research to reach a broader portion of the scientific community." Hui Hu, *EHP*'s international editor, adds that the Chinese-language edition "has become a useful resource for the entire environmental health community, which includes scientists, policymakers, public health practitioners, and the general public." The Shanghai CDC has made publication of the Chinese-language edition possible for 2007, and EHP is currently seeking continued funding for this endeavor.

Tanya Tillett is an associate news editor with EHP. EHP is available online at http://www.ehponline.org.