

金木水火土 COMMENTARY

A Vision of a Green Pearl River Delta: The NDRC's 2008-2020 Outline Plan for the PRD

By Christine Loh, Megan Pillsbury, Andrew Lawson and
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CHINA'S INDUSTRIAL POWERHOUSE

Over the past 30 years, China has undergone remarkable economic modernization, in part driven by its industrial powerhouse, the Pearl River Delta (PRD) region in Guangdong Province. The PRD is one of the most vibrant economic regions globally, boasting a real GDP growth rate of 16.2 percent in 2007. Sixty percent of the world's toys and one-fifth of its mobile phones are manufactured there, and it is a major manufacturing center for everything from textiles, appliances and paper to auto parts, telecommunication equipment and petrochemicals.¹ The government has high expectations for PRD, which has been China's pioneer and laboratory for development and reform.

The other side to this story is the costs at which development has come, especially to the environment. The PRD suffers from poor air and water quality, increased toxicity in the environment, deforestation, erosion, and soil degradation, threatening public health and putting strain on the natural resources crucial to continued development. Costs to public health from air pollution alone are estimated at 1.8 billion Yuan (\$260 million) each year for hospital treatments, doctor visits, lost productivity, and the premature deaths of over 10,000 people.² China now emits more carbon dioxide than any other country and climate change will present

many ecological threats that could greatly undermine economic and human health in the country—with the low-lying Pearl River Delta being particularly vulnerable to sea-level rise and temperature change. Fortunately, the Chinese government's National Development and Reform Commission (NDRC) is paying attention to the drawbacks of unregulated industrialization in the PRD.

THE NDRC OUTLINE PLAN

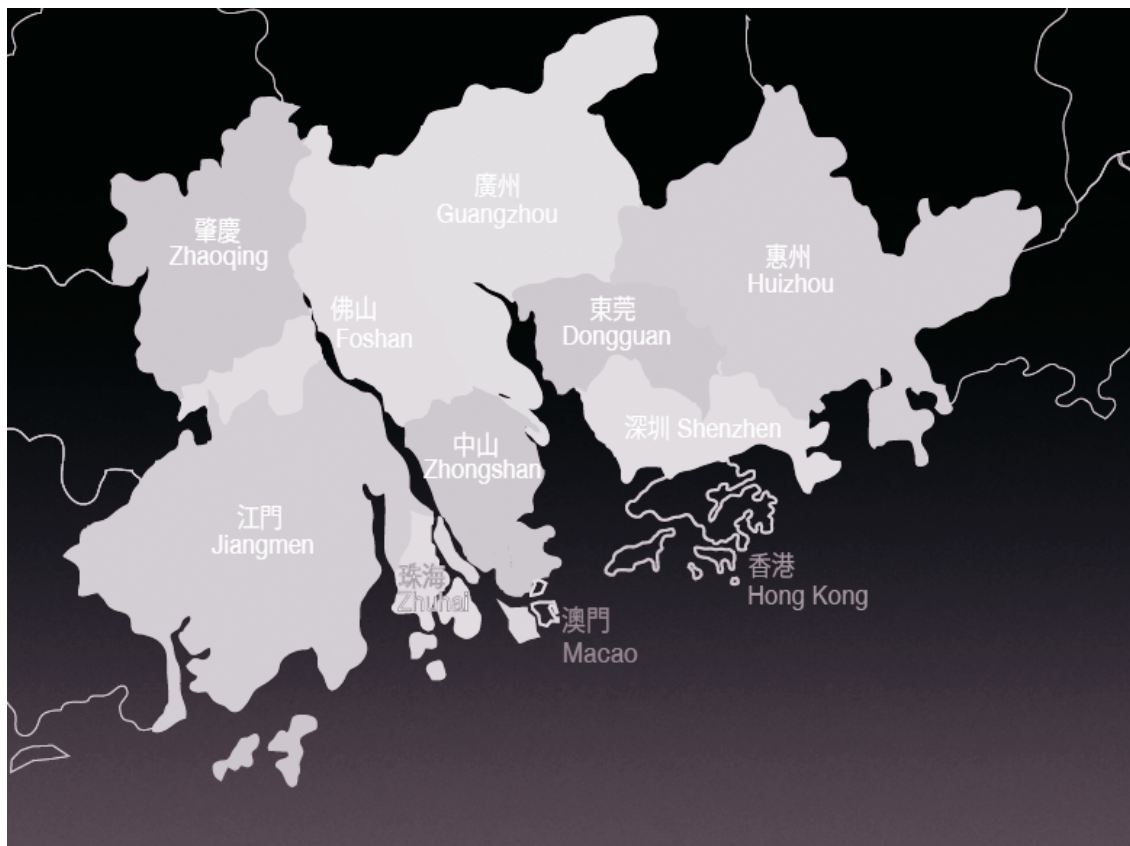
In December 2008, the NDRC released *The Outline of the Plan for the Reform and Development of the Pearl River Delta 2008-2020* in which it challenges the PRD to lead the country onto a path of sustainable development through a transformation of its economy, industry and society, embracing sustainable and environmentally friendly innovations. The *Outline Plan* calls for:

- Modernization of agriculture and the existing manufacturing base as well as the development of new high-tech industries;
- Expansion and modernization of infrastructure;
- Developing and attracting innovative talent;
- Greater regional integration and coordinated development;
- Improved social services and economic opportunities; and,
- Stronger environmental protection and resource conservation.

The success of the PRD region in carrying out this plan could inform other parts of the nation about how to embark on a sustainable development path, moving away from high levels of inefficient resource consumption that have degraded the environment, weakened ecosystems and created excessive greenhouse gas emissions. Already, because of the global economic downturn, many factories in the PRD have been forced to downsize or close and the stronger performers are turning to environmental sustainability as a way to differentiate themselves. Furthermore, as China begins in earnest to deal with its greenhouse gas emissions, the region will have to find ways to reduce its carbon footprint. To transform the economy within a low-carbon sustainable development policy framework, the region's multiple authorities, including the special administrative regions of Hong Kong and Macao, will have to collaborate in articulating a compelling common vision, providing metrics

and policy guidelines to assist decision-making, engaging and educating the general public and coordinating cross-jurisdictional action plans for the short-, medium- and long-term.

However, the *Outline Plan* fails to clarify the importance and difficulty of pursuing the above objectives and should offer greater guidance for achieving these goals. For example, the Outline Plan projects that per capita GDP is to climb from 38,000 Yuan today to 135,000 Yuan in 2020, which would require a sustained real growth rate of 12 percent annually, or a doubling of the economy about every six years. The demand of growth at this level on constrained energy resources and fragile ecosystems will be tremendous; major breakthroughs will be needed in technology, productivity and energy efficiency just to sustain this growth rate, let alone protect the environment.



Map of the Pearl River Delta. Photo Credit: Civic Exchange

AN INSPIRING VISION

The rate of innovation and transformation required to achieve sustainable growth will make it necessary to engage the major stakeholders of society—government, businesses and the public. Government-led direction and regulatory rewards and punishments are essential, but inspiration through a development vision is also crucial. Sustainability needs to become part of habit and culture. This is as true for China as for the rest of the world.

CivicExchange, an independent Hong-Kong-based public policy think tank, has proposed that regional authorities adopt a vision supporting the *Outline Plan* to inspire regional stakeholders to work toward sustainable development. The aim is to generate substantial economic and employment growth and sustainable business and community development. This is to be done by demonstrating that innovation, efficiency and conservation in the use and reuse of all natural and human resources is the best way to increase jobs, incomes, productivity and competitiveness. This approach is the most cost-effective method of promoting renewable energy and clean technologies, protecting the environment and preventing harmful impacts from global warming.³

METRICS AND GUIDELINES FOR TRANSFORMATION

The *Outline Plan* puts strong emphasis on development through the introduction of numerous measurable objectives, from GDP and income to quantity of roads and throughput of container ports. The majority of these metrics are focused on economic outcomes, but less obvious indicators that systematically gauge achievement should also be included, particularly those related to environment, public health and quality of life. These important indicators are missing from the *Outline Plan*:

- Energy efficiency and energy intensity
- Resource productivity
- Greenhouse gas emissions and air quality
- Water efficiency and water intensity
- Human health and safety
- Land use
- Job expansion and types of jobs

The development, use and mandatory public reporting of these types of indicators, in addition to economic outcomes, are important tools for guiding public administrators to achieve the goals of the *Outline Plan*. The inclusion of energy, air and water indicators could be relatively straightforward as the Chinese government has existing standards or targets that regulate these areas.

PEARL RIVER BAY AREA CONCEPT

Implementation of some components of the plan is in development. In September 2009 the Pearl River Bay Area Concept (PRBAC) was introduced at a briefing session in Hong Kong on the *Outline Plan*. Drawing on the examples of the San Francisco Bay Area and the Northwest Ports Clean Air Strategy (NWPCAS) which covers emissions in Seattle, Tacoma and Vancouver, the concept requires Hong Kong, Macao Shenzhen, Zhuhai, Dongguan, Guangzhou and Zhongshan to collaborate in the development of a “green and quality living environment.”

In March 2010 the developers of the PRBAC received agreement from the Guangdong Provincial Government to further expand the concept. Even though the study is not due to be completed until early 2011 the fruit of this new concept began to emerge in the Framework Agreement on Hong Kong Guangdong Co-operation which was announced in April 2010. The framework agreement translates the strategies set out in

the Outline Plan into concrete policies and measures, laying a foundation for incorporating these measures into China's 12th national Five-Year Plan. Chapter six specifically identifies reductions in vehicular and marine emissions, enhancing cleaner production, promotion of electric vehicles and the circular economy, the development of ecological and green corridors and marine parks, and protecting marine water quality.⁵

While these issues build on the foundations of established collaboration between Hong Kong and Guangdong, the PRBAC draws them together under a unified policy vision for the first time. China's track record in swift policy execution suggests that outcomes may come faster than expected. Indeed another cross border joint study, the three-year *Planning Study on the Coordinated Development of the Greater Pearl River Delta Townships*⁶, incorporated both the Outline Plan and the PBRAC into its findings even though its final report was published in October 2009, just a month after the PRBAC was formally announced.

PLANNING OPPORTUNITIES

The *Outline Plan* goes into some detail about economic transformation through the relocation of industrial centers and upgrading of manufacturing. It specifies transformation in terms of applying advanced technology to produce high-value products. This approach would yield opportunities to improve environmental performance as well. For instance, textile and garment production is an important manufacturing sector in the PRD. While per-piece value may be low, production is the core

function of the fashion industry, which in advanced economies is a lively, sophisticated and innovative business. Increasingly, consumers are paying attention to sustainability—ecological and social—in terms of how garments are produced. One organization called the Sustainable Fashion Business Consortium, comprised of more than a dozen leading Hong Kong textile and apparel businesses mostly based in the PRD, aims to encourage

improvements and share best practices in key social and environmental areas of the business. The results are higher quality products, less waste, a fairer workplace and most importantly, more competitive businesses in the global marketplace.⁷

Another challenge that poses opportunities in planning is climate change. The impact of climate change in the PRD region could substantially affect ecology, human health, transportation infrastructure, fresh water and energy supplies, and industry. The *Outline Plan* could incorporate requirements to address adaptation, which offers opportunities for selecting the right development choices in land use and urban planning, water resource management, flood management systems, coastal and river defense and long-term land use planning.⁸

REGIONAL COORDINATION

The PRD region is administratively complex because it encompasses provincial and municipal authorities, special economic zones and special administrative regions. While each has a certain level of autonomy in decision-making, and each has its own perceived interests to protect, the *Outline Plan* is useful to drive all regions to

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look longer term and buy into a compelling new prosperity plan based on industrial transformation. This will require dialogue and exchanges not only among the authorities but also with business and civil society. To start, the region as a whole should conduct research on its ecological carrying capacities, identify its many assets and create a roadmap involving all stakeholders, so that a regional prosperity agenda can be articulated and discussion about delivering tangible results can begin.

Consider the shipping industry. The PRD ports handle some 12 percent of global container throughput, but there is no regulation of the highly toxic emissions from the huge vessels delivering the containers. Neighboring shipping ports compete for business, but that does not preclude them from collaborating on environmental issues. The PRBAC provides a fine opportunity for environmental or port authorities to introduce strict environmental regulations across multi-port regions to address air and water pollution near densely-populated cities. Overseas models include the NWPCAS, through which the ports of Seattle, Tacoma and Vancouver co-operate on the reduction of diesel and greenhouse gas emissions. In California, the ports of Los Angeles and Long Beach aim to reduce shipping-related pollution in the San Pedro Bay and have set impressive “green port” policies.

Civic Exchange has been engaging the key stakeholders responsible for marine emissions in the PRD since 2007.⁹ These include shipping lines, port operators, officials and PRD-based manufacturers. Recent discussions have revealed that neither Hong Kong’s Marine Department nor their PRD counterparts have any objection to a low emissions zone for the PRD, while Hong Kong’s Environmental Protection Department is exploring the possibility of mandating a switch to cleaner fuels for ships at berth.

In summary, the *Outline Plan* set out by the NDRC is ambitious in its aim. The plan’s designers recognize the fact that future development must take a more sustainable path,

and the *Outline Plan* is beginning to shape that path. There are many challenges ahead but also opportunities for cross-jurisdictional collaboration, proactive planning, using metrics and guidelines, and most importantly tapping into the minds and hearts of people in the PRD to set an example for China and the rest of the world.

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ENDNOTES

- ¹ HKTDC. (2008). PRD Economic Profile. [Online]. Available: <http://www.hktdc.com/info/mi/a/mp/en/1X003JXI/1/Market-Profiles/PRD-Economic-Profile.htm>.
- ² Civic Exchange. (2008). A Price Too High: The Health Impacts of Air Pollution in Southern China. [Online]. Available: http://www.civic-exchange.org/eng/upload/files/200806_pricetoohigh.pdf. Civic Exchange proposes a vision statement for the PRD based on “Climate Prosperity” as set out by Global Urban Development. For more information, see Loh, C.; Pillsbury, M.; Lawson, A. (2009). A New Vision of Industrial Transformation. [Online]. Available: <http://www.civic-exchange.org/eng/upload/files/NDRResponse.pdf>.
- ³ There is also ambiguity in the Outline Plan about the relative importance given to development and environment. In section I, part 3, the Plan states, “the region will... take as its top priority to sustain the stable and comparatively fast economic growth,” while in section VIII, part 2, it states the guideline is, “emphasizing both development and conservation but prioritizing conservation.”
- ⁴ http://gia.info.gov.hk/general/201004/07/P201004070113_0113_63622.pdf
- ⁵ For more information, see Planning Study on the Co-ordinated Development of the Greater Pearl River Delta Townships (2009) Construction Department, Guangdong Province, Development Bureau, Hong Kong Special Administrative Region, Secretariat for Transport and Public Works, Macao Special Administrative Region. [Online] Available: http://www.pland.gov.hk/pland_en/misc/great_prd/gprd_e.htm
- ⁶ More information on the Sustainable Fashion Business Consortium can be found at <http://www.sfbc.org.hk>.
- ⁷ This approach is consistent with other research and planning initiatives at the Central Government level, such as the May 2009 White Paper, Actions for Disaster Prevention and Reduction, which calls for a strategic approach to managing the impacts and costs of natural disasters in China, including climate change related disasters.
- ⁸ For more information, see Galbraith, V.; Curry, L; Loh, C. (2008). Green Harbours: Hong Kong & Shenzhen – Reducing Marine and Port-related Emissions. Civic Exchange. [Online]. Available: http://www.civic-exchange.org/eng/upload/files/200806_Gports.pdf.

金木水火土

COMMENTARY

Shifting Power in Central-Local Environmental Governance in China: The Regional Supervision Centers

By Scott Moore

In 2009, water supplies to 200,000 people in the city of Yancheng in southern China were disrupted following a large release of carbolic acid into a nearby waterway. Investigations revealed that the company responsible for the leak, Baoxin Chemical, had been investigated and fined several times by the local environmental protection bureau, but that authorities had failed to stem illegal dumping into the waterway. “Compliance is expensive,” lamented a local official, “and evasion is cheap” (Wang, 2009).

Such incidents indicate the challenges China faces in developing effective institutional capacity for environmental protection and enforcement. The six Regional Supervision Centers (RSCs, or *quyu ducha zhongxin*) established by the Chinese Ministry of Environmental Protection (MEP) in 2006 represent one of the most important recent reforms to China’s environmental protection infrastructure. Apart from their potential to enhance environmental protection in China, the RSCs represent an important case study in China’s environmental policy, the relationship between central and local environmental protection bureaus (EPBs), and the role of international cooperation in strengthening environmental protection in China. This commentary explores the still evolving RSC system and analyzes its significance for China’s continuing efforts to strengthen environmental protection as the country continues its rapid economic development. It draws primarily upon the author’s personal experience of participating

in technical assistance workshops for the RSCs sponsored by the Asian Development Bank (ADB), as well as interviews with several individuals involved with the RSC system.

THE LOCAL CHALLENGE

It is no secret that China’s environmental protection efforts often founder at the local level. The previous failures of China’s environmental protection efforts are well documented (Economy, 2004), as are the structural difficulties facing such efforts within China’s overall policy framework. As a major OECD report concluded in 2006, China’s “general policy framework favoring development over the environment compromises the work of enforcement bodies at the sub-national level and results in widespread non-compliance with environmental requirements” (OECD, 2006). In response to this precarious situation, China’s leadership has promoted the development of a robust system of environmental protection laws and regulations, many of which aimed at circumventing powerful local governments. Central government prioritization of environmental protection is also stressed in the five-year plans and in comments by high-level officials. For example, in a 2007 speech, President Hu Jintao emphasized the importance of building an “energy-efficient and environmentally-friendly society” (Ministry of Foreign Affairs, 2007). The former Vice-Minister of the State Environmental Protection

Administration (SEPA) has similarly urged the development of an “ecological civilization” (*shengtai wenming*) (Pan, 2009).

The growing political profile of environmental protection in China was further reflected by the promotion of SEPA into the Ministry of Environmental Protection in 2007. In the context of China’s shift to strengthen and develop more comprehensive environmental protection policies, the RSC system was established in 2006. At the opening of the North China RSC in late 2006, MEP Vice Minister Zhang Lijun explained that “The six [Regional Supervision] Centers will...take on the task of supervision of local government and local departments of environmental protection, to prevent administrative inaction, corruption or dereliction of duty in the process of environmental management” (Ma, 2008). The RSCs are guided by a technical assistance program funded by the ADB, which sees the development of these centers as key in building “institutional mechanisms to link environmental plans with regional and local economic development policies” (ADB, 2005). Fundamentally, however, the RSC system is intended to strengthen the hand of the central government in local environmental protection efforts.

STRENGTHENING THE HAND OF THE CENTER

The fundamental legal basis for the RSCs is provided by the *Decision of the State Council on Implementing a Scientific Outlook on Development and Strengthening Environmental Protection*, which stipulates that “regional environmental supervision branches will be improved to coordinate trans-provincial actions on environmental protection and push for inspection of looming environmental issues.” The Decision also defines a policy context for the operation of such branches, by declaring that “the State authority inspects, local departments

supervise and individual enterprises are held responsible. The State will give more guidance to and support of local efforts in environmental protection and intensify the supervision on their performance” (State Council, 2005). The Decision thus establishes that RSCs are intended to strengthen the state’s role, while remaining distinct from local environmental protection bureau (EPB) authorities, without local EPB authority to control the activities of enterprises.

Leading up to the State Council Decision, MEP began issuing a number of notices in 2002 that began to spell out how the RSCs would function in practice. An initial Notice established two centers on a trial basis, while a later, 2006 version formally established the remaining four regional branches. These Notices directed that the six centers be located in Nanjing (East); Guangzhou (South); Xi’an (Northwest); Chengdu (Southwest); Shenyang (Northeast); and Beijing (North). In addition, the Notices defined the standing of the RSCs as equivalent to a MEP-level bureau or department, and stipulated that each RSC would consist of 3 to 4 internal departments, whose functions would be defined by each center with the approval of MEP (Wang et al., 2009).

This statutory basis makes clear that the RSCs are intended to operate as “dispatched organs” (*paichu jigou*) of MEP, which act as the local representatives of the central government authority (Cai, 2007). In this capacity, they are intended to guide the implementation of the “national will” (*guojia yizhi*) on environmental protection at the local level (Xia, Shen, & Song, 2008). Central government priorities are to be exercised through eight specific functions of the Regional Centers (SEPA, 2007):

- supervise the implementation of national environmental policies, laws, regulations, and standards of the region within its jurisdiction;
- investigate cases of major environmental pollution and ecological damage;

- coordinate and settle major environmental disputes in trans-provincial areas and river basins;
- supervise emergency responses to and handling of major sudden environmental accidents;
- inspect environmental law enforcement;
- supervise the implementation of the *three simultaneities*¹ system of major pollutant sources and construction projects approved by the state;
- oversee environmental law enforcement of national-level nature reserves (scenic locations and forest parks) and key national eco-function protection areas in the region; and,
- receive, coordinate, and settle visits and complaints related to environmental pollution accidents and cases of ecological damages in trans-boundary areas and river basins within its regional jurisdiction.

A legal analysis conducted as part of the ADB consultation process sheds further light on the central government's attempt to tighten control over the RSCs. Somewhat confusingly, while RSCs are responsible for carrying out the mainly information-gathering activities that are assigned by MEP, they are explicitly not created to provide guidance to local environmental protection authorities (Wang, et al., 2009). Moreover, while lower-level RSC personnel

are assigned by MEP, mid-level officials come from local EPBs or other local agencies. The net effect of this structure is to make the RSCs little more than listening outposts of MEP, in order to avoid duplication (or supervision) of efforts with EPBs.

In sum, the status of the RSCs as dispatched organs of MEP entails an extension of central government authority to the local level, but without significantly expanded powers or capacities. The functions of the RSCs are limited to supervision and information gathering for MEP, which can alert central officials to step in to deal with cases where local EPBs are jurisdictionally incapable of effective action, such as trans-jurisdictional pollution disputes. The 2005 Songhua chemical spill along China's northern border, for example, had international ramifications and was a major embarrassment to Beijing's environmental protection officials (UNEP, 2005). While intended to redress the systemic failures of local environmental enforcement, the RSCs lack capacity to act. This shortcoming is particularly vexing given they were originally created to address the wide gap between central and local environmental protection efforts.

AN INCOMPLETE FOUNDATION



Environmental protection at the local level in China is characterized by various forms of “local protectionism” (*difang baohu zhuyi*) (Cai, 2007). Perhaps the most serious form of such protectionism is the information asymmetry that exists between local and central environmental protection authorities. Local officials are notorious for sealing off or concealing pollution information (Wang et al., 2009) and the scale of the contamination often is not revealed until it becomes extreme, such as the numerous lead poisoning scandals at smelters in

Yunnan and Gansu provinces in 2009 in which hundreds of children were found to have extremely high levels of lead in their blood. While citizen protests over pollution grow (Ma, 2009), there are likely thousands of Chinese communities where health and livelihood problems stemming from pollution do not make national news. Without better supervision, one Chinese legal expert summarized that “it is hard for the state to obtain information that reflects the actual condition of environmental protection work and the [local] environmental situation” (Xia, 2006).

With respect to the RSC system, this asymmetry is exacerbated by significant shortages in resources and capacity. Each of the six centers is expected to employ between 30 to 40 people (Xia, 2006), which is a fraction of the number in each of the U.S. EPA’s 10 regional offices—each of which employs 800 to 1,200 persons. Chinese experts have observed that the personnel strength in each center is “far too low” (Cai, 2007) and an independent ADB analysis indicated that each RSC should have approximately 1,700 staff to adequately supervise the enterprises within its jurisdiction (Gunaratnam, 2008). While the proposed total budget for the RSCs is 1.3 billion Yuan (ADB, 2009), the ADB suggests that the budget for the RSCs must be at least 75 billion Yuan (Gunaratnam, 2008). Another complication in financing is the fact RSCs are predominantly funded by the local governments, which could complicate some of the supervision work by the centers. Limited capacity is characteristic of China’s environmental protection institutions; MEP itself has only some 300 core staff. As the country’s total environmental protection budget approaches 3 trillion Yuan during the 12th Five-Year Plan, the amount devoted to the RSCs is notably very limited (Alibaba, 2009).

Finally, the RSC institutional structure suffers from weaknesses in its political and legal foundation. Wang et al. (2009) conclude, for instance, that the centers are of “low legal status,” since they were established as an administrative

measure by the weak SEPA. The lack of a strong legislative basis puts the centers in a weak legal position as they attempt to carry out their work (Wang et al., 2009). Moreover, though the RSCs possess supervisory functions over local environmental authorities and enterprises, they have no power of legal or administrative sanctions. Given the historic weakness of MEP relative to other government agencies, and the prevalence of informal *guanxi* (personal connections) networks at the local level, this weak political-legal foundation places the RSC system at further disadvantage.

MOVING FORWARD TO STRENGTHEN ENVIRONMENTAL GOVERNANCE IN CHINA

The RSC system is a milestone in China’s efforts to improve environmental protection, establishing the basis of a firm local presence for central authorities to aid in environmental monitoring and enforcement. Indeed, as China’s environmental policy grows more complex and sophisticated, embracing efforts to reduce greenhouse gas emissions and to promote sustainable rural-urban development, such local presence will be crucial to successful implementation. Nonetheless, it is clear that the RSC system possesses significant defects which reduce its efficacy in accomplishing basic environmental monitoring and enforcement objectives, let alone more difficult emergency management, dispute resolution, and other tasks. Redressing these defects, most experts concur, would entail a redesign of the RSC system towards one that emphasizes regional management.

Most crucially, such a system would move away from the current dispatched organ model to grant the RSCs power to directly and effectively supervise the work of local government and environmental bureaus. Specifically, the centers need to move beyond the current focus of only supervising how local EPBs enforce law and be endowed with the right to supervise the local

governments. Such a shift in power implies that the RSCs gradually be granted the power to sanction EPBs for under-performance (Wang et al., 2009). Similarly, other Chinese researchers advocate the gradual provision of a “supervision and management function” to the RSCs on behalf of MEP (Xia et al., 2008).

In addition to this structural reform, experts have suggested several specific modifications that can build the capacity of the RSC system. One recommendation is to provide financial independence for RSCs to free them from local authorities. Others advocate the allocation of special funds to encourage and sustain “innovative work” by the RSCs (Wang et al., 2009). RSCs should be empowered to form partnerships with nongovernmental organizations (NGOs), the press, and community groups to enhance their information-gathering and capacity to promote multi-stakeholder involvement in environmental enforcement. These modifications would thus imbue the RSCs with capacities not possessed by the MEP, despite its role as the central government’s primary environmental watchdog.

THE EVOLUTION OF CHINA’S ENVIRONMENTAL GOVERNANCE

The RSC system is worthy of description and analysis for several reasons. First, it represents one of the most important reforms to China’s environmental protection apparatus in recent years. Second, the system itself reveals a great deal about relationships between central and local environmental protection authorities. Third, the RSC case illustrates the growing role of international cooperation in China’s domestic environmental protection efforts. Far less about the RSC system would be known, for example, were it not for the series of ADB workshops and related publications, from which this commentary is informed. The U.S. EPA has similarly committed to assist MEP in the development of its enforcement capabilities,

in part by sharing knowledge and experience with the RSCs (U.S. EPA, 2008), though little substantive engagement has occurred to date. Ultimately, however, the RSC system is worthy of outside attention because it presents an opportunity to implement vital reforms that are needed if China is to develop strong environmental governance institutions.

The RSC system needs to be recalibrated to better oversee the activities of local governments and their EPBs, while also forming partnerships with citizen groups, NGOs, and media to offset the information asymmetry problem. International cooperation activities, such as the Vermont Law School Environmental program, the American Bar Association, the Natural Resources Defense Council, and other groups that focus on strengthening environmental law and governance in China, can (if given central government approval) help RSCs to develop stakeholder partnerships and develop new tools to improve their supervisory work. In the long run, regional structures can serve to initiate policy experimentation at the local level, adapting and strengthening national regulations and policies to local contexts. Besides continuing exchanges and learning with the U.S. EPA regional offices, a number of international cooperation initiatives, such as the EcoCities Partnership recently announced by the United States and China, can serve as conduits to build regional capacity for such experimentation.

If, as China’s leaders have indicated, the nation is to develop a sustainable development model, better structures and capacities for environmental protection will be necessary. International experience has shown that as countries improve their environmental protection abilities, they almost invariably develop greater regional management capacities. The present RSC system marks an important step forward in China’s environmental protection efforts, but it falls short of the broad-based reform that will be necessary to meet

the myriad, complex environmental challenges China faces in the twenty-first century.

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ENDNOTES

- ¹ This policy directs that infrastructure designed to protect the environment for a given project (especially in construction) be in place at the same time the project itself is being conducted. For more information, see the Sino-Italian Cooperation Program for Environmental Protection, <http://www.sinoitaenvironment.org/ReadNewsex.asp?NewsID=248>.
- ² The author gratefully acknowledges the contribution of Jianbo Ma, consultant on environmental issues in China, on this specific point.
- ³ The author gratefully acknowledges the contribution of Charles McElwee, environmental lawyer, on this specific point.

金 木 水 火 土

FEATURE BOX

Preparing for Humanitarian Disasters at the Third Pole

By Linden Ellis

In May 2010, chinadialogue, the Humanitarian Futures Programme at King's College London, and the Hazard Research Centre at University College London launched *The Waters of the Third Pole: Sources of Threat; Sources of Survival*, a joint report on the growing water crisis in the Hindu-Kush Himalaya.

More than one in five people in the world depend to some degree on the rivers originating in this region, often referred to as the Third Pole because of its large reservoirs of frozen water. But climate change is threatening to undermine the stability of the area. Groundwater contamination, natural disasters—such as drought and flooding—and intra-regional conflicts are very real dangers that pose major challenges for humanitarian intervention.

This report considers the role of water as a potential crisis driver in the region and urges policymakers to prepare for a range of humanitarian emergencies, including mass migration, famine and cataclysmic floods. The authors warn that natural hazards, particularly those relating to water quantity and quality, will continue to hamper socioeconomic development and poverty reduction and could lead to inter-state conflict. chinadialogue's editor, Isabel Hilton, said:

This report is intended to focus attention on the long, complex, evolving crisis in the Third Pole region—a crisis generated by poor water management, intra-regional tensions and climate change—that has the potential to threaten the lives and livelihoods of millions of people. It

brings together the concerns of science, human security and humanitarian perspectives and calls on all sectors to give the issue the attention it demands.

Key recommendations in the report include:

- Pushing the Third Pole region up the agenda of global policymakers;
- Creating humanitarian professionalization programs for sharing best practices and other tools for improving non-intrusive humanitarian intervention capabilities;
- Improving dialogue between the region's countries, including better sharing of scientific data; and,
- Establishing a regional mapping exercise to monitor factors that create humanitarian crises.

The full text for *The Waters of the Third Pole: Sources of Threat; Sources of Survival* report can be found at: http://www.chinadialogue.net/UserFiles/File/third_pole_full_report.pdf.

chinadialogue.net is an independent, nonprofit organization based in London, Beijing and San Francisco. The bilingual website publishes articles by experts, policymakers, activists and concerned citizens in English and Chinese on global environmental issues, with a special focus on China. Linden Ellis is the director the U.S. office of chinadialogue in San Francisco. She can be reached at: linden.ellis@chinadialogue.net.

FEATURE BOX

Relieving Stress on China's Agriculture: Long-Term UK-China Collaboration to Help China Adapt to Climate Change Impacts

By John Warburton

The UK and China have been working together since 2001 to better understand how China is going to be impacted by climate change, particularly in the agriculture sector. But understanding must also lead to action, with adaptation needing to be integrated into the development process at both national and local levels. This work, which is ongoing, will increasingly provide a model for how to approach adaptation in other countries.

In my opinion, this work has also contributed to the realization among top-level Chinese officials that it is important to take global action on climate change as part of the international negotiation process; until very recently, most of the international engagement with China has focused on mitigation, with the result that the very real and urgent challenges that China faces in regards to its own adaptation needs have been sidelined.

CLIMATE CHANGE—YET ONE MORE STRESSER FOR CHINESE AGRICULTURE

China's Policies and Actions for Addressing Climate Change, issued in October 2008, state:

The impacts of future climate change on agriculture and livestock industry will be mainly adverse. It is likely there will be a drop in the yield of three major crops—wheat, rice and corn; ...enlarged scope of crop diseases and insect outbreaks; [and] increased desertification.

Even though assessing the likely impacts of

climate change on crop yields is a complicated process, with some evidence showing that in some areas crops may benefit if agricultural technology can keep pace, the overall picture is grim for China.

Potential climate impacts are very worrying for a country which already faces so many other challenges within the agricultural sector, among them the facts that it has to feed nearly one-quarter of the world's population (1.3 billion people) with only 7 percent of the world's arable land; that it has only one-quarter of the world's average per capita water distribution (one-tenth in large parts of northern China, which are heavily dependent upon agriculture); and that the agricultural land base is fast diminishing due to urbanization, industrialization, and the conversion of arable land to grasslands and forest.

UK-CHINA ADAPTATION COLLABORATION

Much of the evidence that supports the understanding of the likely adverse impacts on Chinese agriculture from climate change stems from collaborative work between the UK and China which started in 2001. A joint project, Impacts of Climate Change on Chinese Agriculture (ICCCA), has combined cutting-edge scientific research with practical development policy advice. Although national in scope, the project included pilot work to develop a stakeholder based approach to

adaptation in the Ningxia region of north-central China. ICCCA was successfully completed in December 2008. The UK-China collaboration is now continuing with a major new project which is going beyond agriculture and looking at additional socioeconomic sectors and geographic areas.

ICCCA was funded by the United Kingdom's Department for International Development (DFID), and the Department for Environment, Food and Rural Affairs, although the latter's involvement has now transferred to the Department for Energy and Climate Change. The project was conducted in partnership with China's Ministry of Science and Technology. The research was led by the Chinese Academy of Agricultural Sciences, in collaboration with leading Chinese and UK climate change researchers.

The following summary of ICCA project findings is distilled from the information provided in 6 "leaflets for policy makers" produced in 2008 and available on the project website (www.china-climate-adapt.org) together with the full accompanying reports.

ANALYSIS OF CLIMATE IMPACTS AT NATIONAL LEVEL

Developing Scenarios of Future Climate Change for China

ICCCA's first task was to understand how China's climate may change in the future. This was done by running the regional climate model, PRECIS (Providing Regional Climates for Impacts Studies), to give detailed maps of climate change during the 2020s, 2050s, and 2080s, based upon two standard greenhouse gas emissions scenarios from the IPCC (Intergovernmental Panel on Climate Change), a medium high (A2) scenario, and a medium low (B2) scenario.

The PRECIS modeling work indicates that the climate in all parts of China will continue to warm, possibly by as much as 4.5°C by the

2080s, together with an increase in the numbers of days where the maximum temperature exceeds 25°C. There may also be a consistent and progressive shift to wetter conditions in the south of China (although the PRECIS model is known to over-estimate rainfall patterns compared to other climate models), but with some northern regions becoming moderately drier. There is also strong evidence that heat waves, temperature extremes and precipitation intensities will increase. Unfortunately, increased precipitation intensity is likely to result in more flooding and storm damage, rather than being beneficially and evenly-distributed across crop growing seasons.

Although there is considerable uncertainty about the detail of future climate change, especially in how the frequency and magnitude of extreme events will evolve, these rates of change are unprecedented in China's history and, together with other shifts in China's climate, will lead to significant physical and socio-economic impacts across the country.

Impacts of Climate Change on Cereal Production in China

ICCCA then used the CERES (Crop Environment Resource Synthesis) models to predict impacts on rice, maize and wheat yields across China, based upon the climate change predictions from PRECIS. The project also assessed changes in yield with and without the potential fertilizing effect of extra carbon dioxide (CO₂) in the atmosphere. This effect is highly uncertain - not least because it is unclear whether, even if extra atmospheric CO₂ leads to enhanced plant growth, this growth translates into higher grain yields, as opposed to extra growth in the non-edible parts of the crop plant such as the stalks.

The results are mixed: Irrigated rice and rainfed maize tend to show reductions in yield, while yields of rainfed wheat tend to increase, when averaged across China. However, all crop yields decrease without the potential fertilization



Water is likely to become an increasingly scarce resource in north-central China, where many farmers already have to collect irrigation water by hand.
Photo Credit: John Warburton

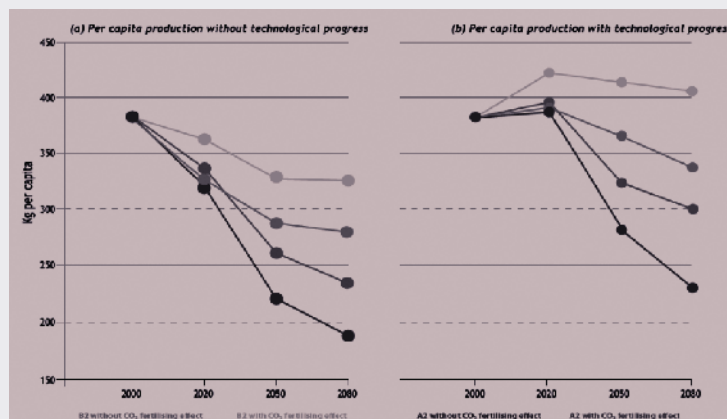
effects of CO₂. The changes get bigger further into the future. Importantly, without improvements in agricultural technology, per capita production declines dramatically relative to today's production. This is summarized in the figure below:

The results show the need to improve understanding of the effects of CO₂ on plant growth, and to obtain better projections of future improvements in agricultural technology. It is also important to note that these projections are likely to be optimistic because, as stated above, PRECIS has simulated a much wetter condition for China than do other climate models. Also, the effects of extreme events (floods, droughts, major storms) on crop growth and water availability have probably been underestimated.

Modeling the Interactions of Climate Change, Water Availability and Socioeconomic Scenarios on Cereal Production

Climate change is not the only challenge facing Chinese agriculture. ICCCA combined crop and water simulation models with climate and socio-economic scenarios to explore

HOW CHINA COULD SUFFER FROM THE IMPACTS OF CLIMATE CHANGE: A LONG-TERM UK-CHINA COLLABORATION IS HELPING CHINA TO UNDERSTAND AND ADAPT TO THESE IMPACTS



Changes in per capita cereal production simulated to 2080 under two emissions scenarios (Source: ICCCA)

how changes in cereal production and water availability due to climate change will interact with other socio-economic pressures in China. Four key variables were included: population growth, GDP growth, changes in water demand between agriculture, industry, and municipal areas, and changes in agriculture land use.

This modeling work suggests that in future, water availability will play a significant limiting role on potential cereal production, due to the combined effects of higher crop water requirements and increasing demand for non-agricultural use of water. The interactive effects of all drivers together led to significant decreases in total production by the 2040s.

Overall, the work of ICCCA strongly indicates that climate change is a massive additional stress on China's future agricultural production. Over the next couple of decades the most significant impacts are likely to arise from the interplay between rising temperatures and the need for more water (or rather, the need to use existing and probably declining water resources more efficiently), and better management of the effects of extreme weather events, especially droughts, floods and storm damage. Successful adaptation policies based on sustained improvements in agricultural technology will be essential to produce enough cereal to keep pace with population growth and the effects of other drivers such as land use change.

WHAT DOES THIS MEAN AT THE LOCAL LEVEL?

Rural Livelihoods and Vulnerability to Climate Hazards in Ningxia

The work described to date took place at a national level, but how does it all relate to the experience of farmers on the ground, and how does it translate into local development policy? To address these questions, ICCCA focused on one area of north-central China, Ningxia Autonomous Region. By working with rural

communities and local institutions, the aim was to understand better their vulnerability to climate hazards and their capacity to cope with and adapt to future climate change.

Ningxia is divided into three agricultural zones, a southern, mountainous, rain-fed area, a central plain with a mix of irrigation, rainfed cultivation, and livestock grazing, and a northern area irrigated by the Yellow River. On the whole, conditions are extremely dry and farming communities face many physical and economic challenges. Farmers in the three agricultural areas have different levels of vulnerability to climate change. Not surprisingly, susceptibility is highest in the middle arid and southern rainfed mountainous areas, because farmers are more exposed to climatic hazards and a greater proportion of income comes from farming activities. However, the entire region suffered from a major drought from 2004-06, and is seeing year-on-year increases in damage from extreme weather events such as hailstorms and periods of hot dry winds.

The farmers in Ningxia use an impressive array of measures—rainwater collection, increasingly efficient irrigation, greenhouse cultivation and switching to new crops—to retain soil moisture and maintain agricultural production in the harsh environment. But a range of factors influence their ability to respond to environmental conditions. When asked about the constraints they faced in adapting to the effects of climate change, respondents most often cited lack of money, available water resources, and inadequate infrastructure.

Developing an Adaptation Framework and Strategy for Ningxia

Some level of adaptation to climate change is now inevitable, and indeed is already happening, as can be seen by the year-on-year northward spread of winter wheat cultivation. Society and individuals must adapt to the changes which will occur—either to avoid negative impacts or to take advantage of new opportunities. Drawing

on the findings of the survey on the impacts of climate change on rural livelihoods, ICCCA produced an adaptation framework and strategy for agriculture in Ningxia. The framework has six main stages, illustrated in Figure 2.

Development of the adaptation framework in an iterative, participatory manner leads to the identification and prioritization of a range of adaptation options, which can be incorporated into development processes, and whose subsequent implementation can be monitored, evaluated, and modified as appropriate. Experience in Ningxia is showing that local level changes are further enhanced when underpinned by a systemic shift in the region-wide planning process. Thus, Ningxia has established a regional cross-departmental group on climate change adaptation, is undertaking a general drive to raise awareness of climate change trends and impacts, and is committed to making adaptation an important element of all relevant development and poverty-alleviation plans.

ADAPTATION WORK CONTINUES WITH A MAJOR NEW COLLABORATION

Following the success of ICCCA, China and the UK, together with the Swiss government, have now initiated a new and much larger project, Adapting to Climate Change in China, or ACCC.

ACCC aims to improve Chinese and international knowledge on the assessment of climate impacts and risks, and to develop practical approaches to climate change adaptation. It will do this by helping China to integrate climate adaptation into the development process to reduce its vulnerability to climate change, and by sharing this experience with other countries. There will be five main outputs:

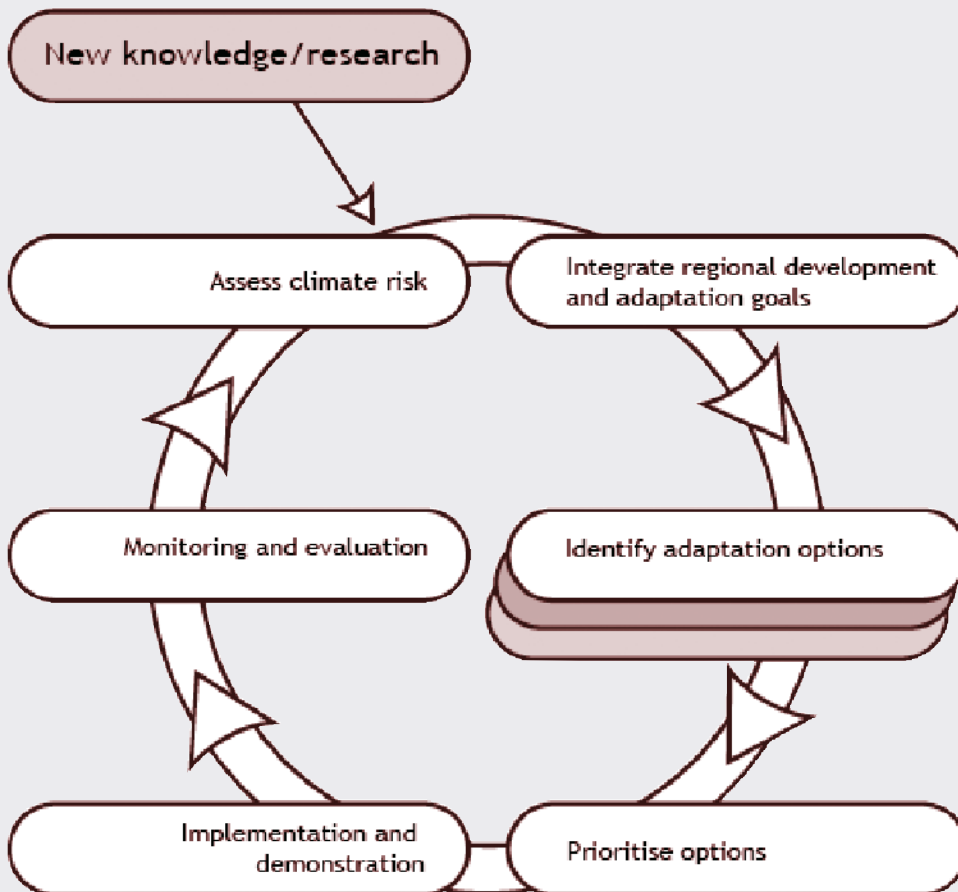
- Improved development of, and access to, climate change science in China;
- Comprehensive risk assessments in selected socioeconomic sectors, based upon an analysis of vulnerability and impacts, produced at national and provincial level;
- Climate risks integrated into planning and management within the three project provinces, and informing national level processes;
- Increased awareness and capacity among Chinese policymakers and other key stakeholders to address climate change adaptation within China's development process;
- Knowledge sharing between China, UK, and other countries in Asia and Africa, to further develop climate change adaptation approaches.

ACCC started in June 2009 and will continue to work nationally and in three specific provinces—Ningxia and Inner Mongolia Autonomous Regions, and Guangdong. ACCC will also focus on specific sectoral areas that are likely to be heavily impacted by climate change.—agriculture, water resources, disaster risk reduction, and health. ACCC will then develop detailed risk and vulnerability assessments, and use case studies to identify specific adaptation options which are relevant to local communities and decision-makers. It will use the Adaptation Framework approach described above to develop adaptation strategies.

ACCC will also share its results, lessons and experiences as widely as possible. This will include involvement in international adaptation networks, and direct contact with adaptation program in other countries in Asia and Africa. ACCC will bring together the best international and Chinese expertise to tackle this shared challenge.

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AN ADAPTATION FRAMEWORK - EACH STEP OF WHICH MAY REQUIRE CAPACITY BUILDING



Source: ICCCA, 2008

Incineration: A Dangerous Policy Option for China's Municipal Solid Waste

By Zhao Ang and Mao Da

AN INHARMONIOUS ODOR

The evening of August 24, 2008, while the closing ceremony of the Beijing Olympic Games held, was not enjoyable for Zhao Lei, a resident in the eastern suburb of Beijing because the intolerable odour swept away his morale in such a “harmonious night” for the country.

The odour was not unfamiliar, but especially annoying when it came in on such a special evening. The smell was from Gao An Tun, a “sanitary landfill”, about 2 miles away at the northeast direction. For the past two years, local people had been complaining about the notorious management of the landfill. Their petition reached the district government and even the municipal government, but the problem was getting worse even during the Olympic. The landfill ate the most garbage from the Olympic sites. Its daily input suddenly increased to its operation limit and even beyond.

The odour night was just a microcosm of the chronic garbage crisis in Beijing, and in many other huge cities in China. Before the Olympic, Zhao Lei and his neighbours had already been suffering from the rapid growing waste. Their complaints did raise the attention of the government. The authority promised to build up a modern incinerator next to the landfill. The residents thought the odour would go away when the incinerator takes over the job.

However, the situation did not improve much when the incinerator started to work right

before the commencement of Beijing Olympic Games. When local residents accumulated more information about incineration, they realized they were fighting against the two “devils”. The newcomer seems to be more difficult to deal with than the first one. In the near future, a large number of Chinese people will face similar problems that Zhao Lei and his neighbours are facing.

THE TRASH DILEMMA FACING CHINA'S CITIES

Over the past three decades as Chinese cities have exploded in size and number, municipal solid waste (MSW) (which includes organic waste, paper, plastic, glass, metal, and other waste, but not toxic and medical waste) has become a major social and environmental challenge (World Bank, 2005; Diaz & Warith, 2006). At the end of 2007, China's urban areas produced about 135 million tons of MSW, compared to the 254 million tons in the United States (China Statistical Yearbook, 2008). The economic history of many developed countries has shown that the decoupling of MSW growth from GDP growth is possible with continuously improved MSW management (The Economist, 2009). The annual growth rate of MSW is predicted to decline from 7 percent for 2009 to 2019 to 4 percent for the period from 2020 to 2030 when China's GDP per capita reaches nearly \$5,000. Nevertheless, by 2030, China is estimated to generate 480 million tons of MSW

annually (World Bank, 2005).

For decades, the dominant MSW management method across China has been landfills (Lacoste & Chalmin, 2006). Landfills demand less financial investment but can cause serious and irreversible groundwater and soil contamination if poorly done. Well-lined and properly managed landfills that meet international standards and effectively alleviate contamination have increased in number in China over the past few years; most of them are located in highly developed cities on the east coast. However, the average quality of landfills throughout the country is troubling. A survey across China indicated that no landfill satisfies all national environmental standards. For example, 231 of Beijing's 490 landfills pose a high risk of contaminating groundwater and soil (Jiang & Wu, 2008). This poor performance of Beijing landfills is being improved, for landfills in the capital face stricter regulations than other cities. In most Chinese cities the separation, recovery, recycling and composting, which are major components of MSW management that are neglected by government policy. Source reduction, which is the highest priority of modern Integrated Waste Management used in many developed countries, is scarcely applied in China.

Incinerator Rush

China's first incineration plant began to operate in Shenzhen in 1998. Since 2000, incineration has become a highly prioritized approach for many local governments to resolve the problem of MSW. In 2008, the China Statistical Yearbook reported that 14.35 millions tons of waste, 11 percent of the country's MSW, was processed through incineration plants in 2007. After peaking in the 1980s and 1990s, incineration in industrialized countries has declined in use due to disastrous environmental pollution, high economic costs, and a shift to other forms of waste treatment and reduction.

According to China's 11th Five Year Plan

(2006–2010), more than \$6 billion was targeted for building and renewing 82 incineration plants (Jiang & Wu, 2008). China plans to process 30 percent of the country's MSW, about 126 million tons, by 2030 using the waste-to-energy approach (ADB, 2009). This approach encompasses incinerators and methane collection in landfills. In Beijing, the municipal authorities plan to invest \$1.5 billion to build dozens of incinerators with the capacity to consume 3 million tons of MSW until 2015 (Beijing Science and Technology Report, 2009). According to AMEC Earth & Environmental, 127 Chinese cities could each be generating over 1 million tons of MSW annually by 2030 (World Bank, 2005). It is estimated that hundreds of incinerators will be built and operated nationally during the next two decades. All kinds of policy incentives have been issued to support this governmental objective, including value-added tax refunds, prioritized commercial bank loans, state subsidies (2 percent) for loan interest, and guaranteed subsidized prices for electricity from waste (World Bank, 2005).

Foreign investors are moving quickly to take advantage of newly mandated waste development technology and over 100 domestic companies and research institutes across China have also joined the "Incinerator Rush" (Cheng et al., 2007). At the China Solid Waste Management Summit 2009 (24–25 September) there was enthusiastic discussion by national policymakers, investors and developers about the potential of incinerators in China. However, green groups and local communities worry about the environmental and health impact brought by the boom of incinerators. Without comprehensive environmental impact assessments and effective public participation mechanisms, the great leap into incinerator development in China may put ecosystems and public health in considerable danger. The emitted pollutants—including dioxins, mercury and others—of incinerators are highly toxic. No national statistics demonstrate how many

incinerators in China satisfy international environmental standards and the communities near incinerators have no access to information about emissions.

THINKING LIFECYCLE INSTEAD OF BURNING

Even though quite a few advanced management models, policy tools and new technologies have been developed to assist decision-makers to tackle MSW issues over the last decade, the major solutions still focus on recycling, composting, burning, and landfill. The latest approaches based on life cycle assessment and cost-benefit analysis of environmental and social impact have demonstrated that in order to minimize the negative effects of MSW, the top-tier management priorities should be source reduction, efficient separation during collection, and increased recovery and recycling. The second-tier priorities should be composting and building well-lined landfills with biogas collection. Incineration with the latest technology to minimize pollution is generally seen as the lowest priority (De Feo & Malvano, 2009; Hanandeh & El-Zein, 2009; Diaz & Warith, 2006).

Because environmental regulations, technology, financial capacity, natural resource profiles and historical situations are diverse, prioritization of MSW methods varies among countries. For example, the incineration rate is high in Japan and many western European countries due to land constraints. But in the United States, where land is relatively abundant, landfill is the dominant method. The higher incineration rate of MSW in developed countries is attributed to limited land resources and an initial lack of understanding of the negative impact of incinerators. Today, stricter environmental regulations that were driven by pressure from environmental groups and the general public inhibit the use of incinerators. The argument by some incineration developers that waste burning provides renewable energy

has not swayed new investment by governments in most industrialized countries. In the European Union (EU) most countries strongly favor recycling over incineration in terms of energy saving and the EU Commission maintains that incineration as an energy recovery method is secondary to reduction and recycling.

In addition to its environmental downsides, incineration is also much more expensive than landfill. The international average cost to incineration is about \$150 per ton, compared to \$30 per ton to landfill (World Bank, 2005). Incinerators also discourage resource recovery and recycling of the waste flow. China's MSW has lower caloric value per unit than that of OECD countries, as organic materials account for about 50 percent of China's total MSW. This trend will not change greatly from now to 2030 (World Bank 2005, OECD, 2009). This heavy organic proportion means that China's incinerators have much lower burning efficiency rates than those of developed countries. To help improve combustion, Chinese incinerators are allowed by China's Regulation on EIA in Biomass Generation to add up to 20 percent of coal content in waste incineration projects (ADB, 2009). Of 72 incinerators in operation in June 2007, nearly one-third added 20-40 percent coal to support the combustion efficiency, which creates significant problems in controlling ash and toxic emissions (Chen et. al, 2009; ADB, 2009). More significantly, low environmental emission standards and weak environmental enforcement in China make the public increasingly worried about the capability of the government in holding the pollutants of stack emissions, bottom-ash, and fly-ash at safe levels in existing and future incinerators (Chen et al., 2009; Word Bank, 2005). Facilities to remove ash and toxic materials are very expensive, particularly for dioxins, which are also the most harmful. Some conflicts between local communities and developers of incinerators have indicated that there is not an effective legal framework for stakeholders to participate in the decision-making process for incineration

projects. Without public involvement and transparency it is highly questionable that Chinese authorities can regulate MSW incineration as a type of renewable energy generation, let alone gain public support to build a large numbers of incinerators (National Renewable Energy Development Plan, 2007).

PONDERING THE CARBON FACTOR IN MSW MANAGEMENT

International climate change policy schemes such as the Clean Development Mechanism (CDM) allow developing countries to obtain financial support from developed countries by applying renewable energy technology, including small hydropower, wind power and solar energy. Chinese MSW incineration projects have started to apply for carbon credits through CDM. The National Development and Reform Commission approved an incinerator in Wuhan to be eligible for CDM in 2008. The CDM fund appears to have become another stimulus for the growth of MSW incinerators in China. However, developing a CDM methodology for MSW incineration projects will significantly increase the cost of building incinerators thanks to strict regulations on environmental emission standards under the CDM. Until now, no incineration project has been awarded carbon credit under CDM (CD4CDM, 2009). As green groups raise their voice against the marriage of CDM with MSW incineration, the green washing efforts of MSW incinerator developers will be difficult. Meanwhile, methane collection and power generation from landfills is a comparatively efficient and cheap way to fight greenhouse gas emissions from waste. One such landfill project in Guangdong Province has successfully obtained CDM funding (Nan Fang Daily, 2009).

Even without CDM support, Chinese developers and policymakers emphasize the carbon reduction effect of MSW incineration, particularly for the future when China will



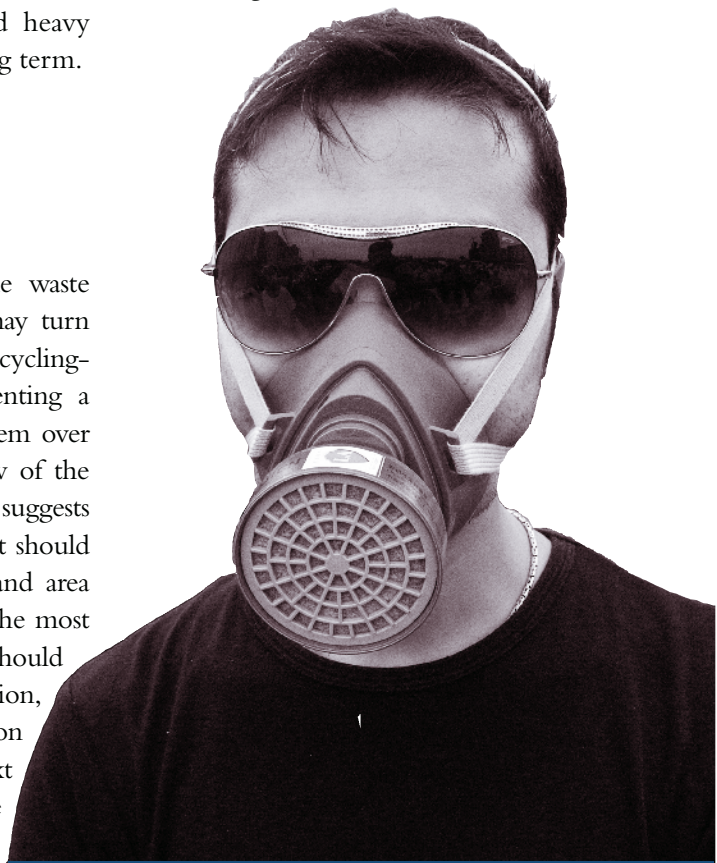
A glimpse at some incinerator and landfills in Beijing area. Photo Credit: Mao Da

have to meet international climate policy obligations to cut greenhouse gases. However, studies indicate that even if the possible emission reduction effect of incinerators is considered, incineration still compares unfavorably against other waste management strategies. In analyzing carbon emissions from 11 different types of MSW systems, Hanandeh and El-Zein (2009) found that burning all waste without efficient separation and collection is the worst choice as it is the most polluting and least economically efficient. Unfortunately, most cities in China have not established a productive system to separate, collect and recycle MSW (Jiang & Wu, 2008; World Bank, 2005). A number of research efforts, which take into account the carbon emission reduction effect of incineration, demonstrate that incineration is still the worst option for MSW management as it brings unbearable environmental impacts and heavy economic and social burdens in the long term.

HOW TO BEGIN THINKING DIFFERENTLY ABOUT WASTE MANAGEMENT

With the boom of incinerators in the waste industry, China's MSW management may turn away from a source reduction and recycling-based approach, and look to implementing a landfill and incineration-dominated system over the next twenty years. This brief review of the latest thinking on MSW management suggests that truly sustainable MSW management should not follow this path. China's massive land area makes landfill an easier option; but for the most benefit in the long run, Chinese cities should first prioritize source reduction, separation, recovery, and recycling. Anaerobic digestion and composting should be the next priority and current landfills must be better managed with increased methane collection and power generation. Finally, incineration should be an option only if an efficient separation and recycling system is established and emission of

incinerators is effectively regulated. Even in the context of tackling global warming, these priority rankings will not change. In order to prioritize more preventative waste management approaches, Chinese cities will have to divert financial resources and policy incentive away from the end-of-pipe measures, namely landfill and incineration. In addition, a legal framework should be provided to address conflicts of interest among different stakeholders, with a priority on protecting and empowering communities. While challenging, it is crucial that legal institutions are created to prevent business groups from overly influencing local authorities in MSW decisions. A good start would be to require that incineration plants make their emission data public. Only real political will and action and not just lip service can reverse the current trend towards an unsustainable waste management future.



In the run up to the Olympics, residents in the affluent Changying district in east Beijing who live near the Gaoantun landfill and waste incineration facility took to the streets in an escalating campaign against the city's biggest dump site. Residents claimed that this facility was polluting the air with a foul stench and dangerous dioxins.
Photo Credit: Jonathan Watts, author of new book *When a Billion Chinese Jump: How China Will Save Mankind—Or Destroy It*

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SPOTLIGHT ON NGO ACTIVISM IN CHINA

The Gun Shoots The Bird That Sticks Out

By Xiu Min Li

In Green Eyes' Wildlife Rescue Center in Cangnan, Guangdong Province there is a small eagle that was rescued many months ago. He is skinny with dark black feathers and can no longer fly. This once great bird is relegated to walking in a cage that he shares with two peacocks and a duck. Although mostly healthy, the bird nonetheless appears anxious and neurotic. He walks back and forth in the same spot and his head twitches every step of the way. Volunteers believe he ate something poisonous and is suffering from some form of neurological disorder.

The twitchy bird oddly returned to my mind as I chatted with Fang Minghe, Green Eyes' founder and director, about the state of grassroots nongovernmental organizations (NGOs) in China. The sector is both thriving and anxious. On one hand, people working in green NGOs are excited by the Chinese government's increasing prioritization to protect the environment and the international community's attention and funding of grassroots groups that are addressing China's immense environmental problems. On the other hand, there is a fear that too much success of a Chinese NGO might illicit the attention of political entities or individuals in China that perceive the sector as a threat.

While Western NGOs normally highlight media coverage of their accomplishments to boost their reputation, some environmental activists try their best to stay under the radar. When Green Eyes won a landmark victory in March 2009 and rescued a gray nurse shark, Fang was wary and unwilling to answer a few

eager questions from an international paper. When I asked Fang to explain his reaction, he stated simply, "the gun shoots the bird that sticks out." This popular Chinese saying refers to the risks of being too conspicuous in one's public conduct.

BREAKING OUT OF THE CAGE

Sometimes Chinese NGOs must tread cautiously and anxiously like the caged bird and activists feel compelled to carefully avoid any missteps and hush themselves when they think they may be making too much noise. However, there are signs of more openness among Chinese green groups. For example, in early 2009, the Gansu NGO Green Camel Bell tried to utilize the new Environmental Information Disclosure Regulation to request a list of polluting enterprises from a local Environmental Protection Bureau (EPB). The Green Camel Bell staff received a phone call and an invitation for an in-person meeting, at which EPB officials told them that the information could not be released at the moment due to its potential impacts on companies that were already crippled by the economic downturn.

The EPB's open reception marks progress from the organization's early days when Green Camel Bell engaged in a campaign to prevent the city from shutting down one of Lanzhou's popular electric bus lines. Aside from refusing the organization's request for information regarding the government's reasoning behind the decision, official strongly "advised" Green Camel Bell to stop engaging in its "disruptive

advocacy.”

In early 2009 some of my other Pacific Environment colleagues and I visited another NGO’s project site in a southern city, where local efforts recently shut down three polluting factories after a two-year campaign. However, our presence generated official paranoia that evidently lasted for months. The local NGO’s campaign leader was summoned to meetings with high-ranking officials and cautioned not to get involved with foreign organizations. The officials further claimed to be aware of some articles that were published in foreign papers about our visit, but refused to cite their sources. The leader became anxious that we had written something that had put him in political danger. Clearly, the goal of the officials was to create mistrust between locals and outsiders and to discourage cooperation.

Small NGO leaders regularly lament to us that groups like theirs do not have the protection many Beijing NGOs enjoy. They can not advocate against polluting enterprises or local government violation of environmental regulations with the same fanfare and aggressiveness as bigger Beijing groups like the Institute for Public and Environmental Affairs and the Center for Legal Assistance to Pollution Victims. This view is widely shared among young environmental activists operating outside of major cities like Beijing, Shanghai or Guangzhou.

However, two recent incidents of government harassment of well-known NGOs in Beijing demonstrate that no one is immune from sanction when the political wind changes direction. In June 2009, authorities practically shut down two NGOs—Yirenping (a group fighting discrimination against HIV-AIDS infected individuals) and Open Constitution Initiative (a group focused on rule-of-law issues)—based on allegations of tax and registration irregularity. In the same month the government disbarred 50 lawyers known for being active in politically sensitive advocacy

work. Intense and arbitrary scrutiny such as this critically affects the growth and effectiveness of grassroots civil societies in China.

ACTIVISM WITH CHINESE CHARACTERISTICS

Local NGOs are already careful at cultivating their role as a constructive force within the environment they operate. The successful ones build strong connections, or *guanxi*, with the government, media and academic institutions. It is what one Chinese observer described as “activism with Chinese characteristics.” Once *guanxi* is established, the NGOs can be effective in their own ways.

Green Eyes is perhaps one of the more successful groups engaging in such activism. In the mere decade since its founding, Green Eyes has built a remarkable reputation among key stakeholders in its home province of Zhejiang. Fang and some of his staff are environmental lecturers officially designated by the Wenzhou EPB’s Propaganda Department to regularly speak to schools and universities about environmental protection.

In our brief three-day visit in March 2009, I witnessed how Fang Minghe was able to tap on his good reputation in helping local officials and educators in environmental education to help his group obtain critical resources for his organization. The Cangnan Education Bureau Chief donated a vacant school to Green Eyes, enabling them to expand their Wildlife Rescue Station and help supplement the work of the bureau. The Wenzhou City University also provided them with a free office on campus to enable them to expand their environmental education work with youth. The new office unveiling ceremony was marked with fanfare and captured with a photo story published in the Wenzhou Metro Post.

After building a strong reputation in Zhejiang, Fang expanded into Guangdong and formed the South China Nature Society



David Gordon, director of Pacific Institute, meeting with students who work at the Green Eyes Wildlife Rescue Station in Wenzhou City, Zhejiang Province.
Photo Credit Xiu Min Li

(SCNS). Utilizing their experience working with local governments in Zhejiang, Fang and his team regularly visits the Guangdong EPB to report on their work and he proactively seeks consultation on their projects. These efforts helped build a strong cooperative foundation with the EPB, which designated a liaison to receive SCNS and provide information and guidance for this NGO's work.

Within two months of opening its door, the Guangdong office garnered attention in March 2009 and literally caused a sensational stir among the “eat–anything” Cantonese for saving a gray nurse shark from being served as shark fin soup. SCNS volunteers appealed for public support with a parade through the streets of Guangzhou and received monetary donations from citizens and positive reception from the media. The restaurant owner went from being stridently

dismissive of their efforts to ceremoniously announcing their decision to give up and donate the shark to the Guangdong Aquarium. However, this success did not go unnoticed and Fang's staff has since been directed to tone down their work by government representatives.

As China develops its economy, the society must recognize the inevitable growth of NGOs and the value of their presence. Globally and within China NGOs have proved to be effective agents for incremental changes that benefit both society and government. The list of accomplishments by Chinese NGOs is long and growing. For example, domestic organizations like IPE have created successful tracking systems to monitor polluting enterprises and local implementations of environmental laws; others have built organic water treatment system that successfully cleaned up polluted farmlands and

fish ponds; and some are engaging in large-scale projects to adopt alternative energy that are fundamentally changing how rural economies operate.

All things considered, China's local governments can and will benefit from supporting local NGO efforts. Furthermore, the national government can and should do more to enable and protect these grassroots environmental efforts, specifically by reforming the current registration regulations that inhibit the growth of the NGO sector and encouraging local governments to collaborate more with NGOs rather than to simply monitor them. These changes would help promote the independence and self-governance of NGOs and undoubtedly be more constructive than "shooting the bird that sticks out."

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Xiu worked for 5 years as a labor union organizer in San Francisco and gained valuable skills in community organizing. Xiu traveled extensively in China while living and studying in Beijing, where she worked on research projects relating to the social impacts of urban development. She can be reached at: XmLi@pacificenvironment.org.

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COMMENTARY

Greenlaw and the First Year of China's Open Environmental Information Regulations

By Hu Yuanqiong (Translated by Michael Zhang and Jacob Fromer)

On October 5, 2008 the Beijing office of the Natural Resources Defense Council (NRDC) re-launched a newly revamped Greenlaw (www.greenlaw.org.cn) website, which aims to disseminate current information on environmental law and citizen participation in environmental policy developments in China. The Greenlaw website previously sent out two to three updates a week, however the older website was unable to keep up with explosion of news stories and policy developments after the Chinese Ministry of Environmental Protection (MEP) issued its Open Environmental Information Regulation (for Trial Implementation) on May 1 2008. Today the Greenlaw site posts daily updates with hundreds of news pieces about open information and nearly a quarter of all the environmental law-related blog posts are about open environmental information.

The State Council's Regulations on Open Government Information that was issued on May 1, 2008 sets legal obligations on the Chinese government for open government information. MEP's Open Environmental Information Regulation appeared as the first implementation measures issued by a government bureau and notably linked the required disclosure responsibilities for enterprises to the cleaner production promotion laws. The open environmental information measures promise to be the proverbial hammer that will smash the wall between polluting enterprises and the public, turning China from a country that singled-mindedly emphasizes economic growth to one that focuses on sustainable development.

While these measures represent a significant potential for improving China's environmental governance institutions, there are still challenges to be confronted. Looking back at the past year reveals a developing legal regime where the circumstances remain quite complicated.

THE GOVERNMENT AND THE PEOPLE GROW UP TOGETHER

If one views the Yuanmingyuan Park leak proof project debate four years ago to be a positive start in generating meaningful legal dialogue between the public and the State Environmental Protection Agency, then the Xiamen PX episode two years later marked an even greater high point in the advancement towards effective dialogue. In 2008, following the official implementation of the Open Environmental Information Regulations, various environmental protection NGOs had issued local citizen guides on open environmental information and public participation, in addition to conducting round-table conferences and training activities.

Moreover, these environmental NGOs also began to test the law in practice. In October 2008, when the All-China Environment Federation hosted its annual meeting on sustainable development for environmental NGOs, many of the attending organizations, lawyers, and legal experts shared their experiences with the new open environmental information laws. For example, Greenpeace (2008) discovered in its "Investigation on Enterprise Pollutant Information Disclosure" that the BASF

Corporation was not as transparent with its environmental record in China as it was in other countries. Greenpeace then submitted an application to the Shanghai EPB seeking disclosure of BASF's emissions figures. Their attempt at accessing this information failed, though it raised a series of questions for the Chinese public and legal experts that still require answers: First, is the current system for publicizing an enterprise's environmental record enough to satisfy the public's right to that information? Second, how to define business secrets that can be omitted from emission information of enterprises?

There also was some positive results in the first year of implementation. In August 2008, Friends of Nature joined together domestic environmental NGOs to investigate the Gold East Paper Company—a highly polluting enterprise seeking an Initial Public Offering (IPO)—about its environmental protection record (Hu, 2008). In March 2009, the Ministry of Environmental Protection fulfilled its obligation to disclose such data when it informed the public about its own investigation of the Gold East Paper's attempts to join the market and gave clear and open answers to the questions raised by the environmental NGOs. Although the emissions of Gold East Paper still remain a concern, this move by the MEP is worthy of praise.

On June 3, 2009, the Beijing-based Institute of Public and Environment together with NRDC launched China's first civil society evaluation index on government's environmental information disclosure performance—Pollution Information Transparency Index (PITI)—and its ranking results for 113 cities in China. (Wang, 2009) By evaluating what the city EPBs have disclosed according to the laws, PITI gives quantitative articulation identifying the progress and gaps in the implementation of open information in environmental sectors. PITI thus shows an innovative way of using open the information law for better environmental

governance in China.

The actions of legal professionals have aided the advancement of environmental information disclosure. On May 5, 2008, mere days after the enactment of the open information regulations, Shanghai lawyer Yan Yiming filed an environmental information disclosure request, thus initiated the legal world's push for more transparency in environmental information.

In the first year, what mattered most was getting the public focused on gaining greater transparency with environmental information. For NGOs, there is no longer the excuse of not having legal support; the question now lies more on how to make the law effective. For legislators, the dialogue process between the government and NGOs provides additional assistance towards implementing legislative goals effectively and quickly, including fixing legal loopholes and clarifying ambiguities vulnerable to exploitation. For the government, there is no longer time to slowly nudge the notion of change, because the new openness has become a legal obligation.

THE SLOW DEVELOPMENT OF THE COURTS

After May 1, 2008, five citizens of Rucheng, Hunan Province initiated China's first open information suit (Chen, 2008). But one month later, the the Chenzhou court still had not taken up the case (Zhao, 2008). The public worried that if the justice system stayed silent, then these new open information laws would serve nothing more than a decorative function. But perhaps this was only a reflection of transition difficulties, because on October 10, 2008, the China Youth Daily and Beijing Daily successively released reports of citizen victories in seeking information disclosure from the Hubei and Zhejiang provincial governments (Hu, 2008). Before the deadline, Hebei's Baoding City also ruled in favor of some of its citizens seeking open information from the government.

Although we cannot view the actual environmental information case reports, these aforementioned cases will undoubtedly provide an opening for those who have been seeking to shine light on open environmental information. The open information judicial decisions to date have only addressed a small fraction of the problems that hinder effective implementation of the law faces, but it is worth waiting for the courts to become an even more powerful force in pushing for the legal development of open environmental information.

A CAUTIOUS RESPONSE FROM ENTERPRISES

In 2008, 250,000 people in Guangzhou submitted applications to the government for open information (Wu, 2009). This case demonstrated a progressive government image in dealing with increasing public demands. Comparatively, a few of the major enterprises who fall under the new transparency rules are simply turning a cold shoulder towards information disclosure requirements.

During Greenpeace's campaign, BASF was arrogantly silent the whole time and has still not yet taken the initiative to voluntarily disclose its environmental information. From last June, IPE led more than ten environmental NGOs in publishing the "Enterprise Environmental Information Disclosure Alert Letter," directed at over 30 manufacturers in China who were determined by the government to conduct mandatory clean production audit. According to the open environmental information regulations, these enterprises are obligated to publicize detailed pollutant emissions information. Otherwise, the penalties include fines and forced disclosure by EPB. But only a few enterprises actually followed the regulations, with most choosing to simply stay silent, and the conduct was not punished.

Within these grey areas, the attitude of enterprises towards open environmental information remains vague and conservative.

Luckily we still saw some, though limited, shining points. On June 5, 16 companies from Tianjin economic development zone released their information voluntarily, marked a hopeful start for future development (Li & Wang, 2009).

THE MEDIA HARD AT WORK

On March 31, 2009, for the first time since the official enactment of the "Regulations on Open Government Information" and "Measures on Open Environmental Information (for Trial Implementation)," government bureaus began releasing their legally-mandated annual open information work reports. In the beginning of April, *Caijing* (Lan & Qin, 2009), the *Investigative Daily* (Zhi, 2009), and some other media outlets published commentaries on the annual reports. Reports revealed that many ministries and bureaus under the State Council had not fulfilled their obligations to release their annual reports on time. In the same month, using the information from the work reports, the media (Song, Deng & Wu, 2009) exposed the challenges open government information continues to face. For example, while 250,000 applications for open information were submitted in Guangzhou in 2008, one nearby city received only one application in all of 2008 (Wu, 2009).

There were many factors that made 2008 an extraordinary year, and the media played an irreplaceable role in following the implementation of government transparency. The prompt follow-up reports to some legal cases, as well as commentaries on the cases by experts and newspapers, were key in spreading awareness and usage of the new regulations. Discussions of the range and validity of open information (Zheng, 2008), analyses of the practical legal problems (Huang, 2008) related to open information, and dialogues on how to improve the existing system (Sohu, 2008) all shed light on the main issues in the first year of the open information regulations. But even still,

most newspaper reports seemed half-hearted and shallow. This does not meet the enormous public demand for open information. As the law continues to develop, the media must get involved even more deeply.

FUTURE IMPLICATION ON ENVIRONMENTAL HEALTH ISSUES

2008 also marked a year of reports on environmental health cases. While nontransparent information has caused public furries on severe pollution incidents in the past, several reported incidents about children blood lead poisoning caused by industrial pollution again turned public attention to information of environmental health. Lawyers and experts have started looking at it from the information transparency perspective, reasoning that lacking of information may cause low awareness of public and weak supervision on the polluters (Du, 2009).

With reviewing the one year law implementation, we believe that information transparency can do more than it has been doing in China in promoting a greener development and safeguarding people's well-being.

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