# More Players on the Stage: New Trends in Shanghai's Water Pollution Control Policies

*By Seungho Lee*

To even the first-time visitor, Shanghai's gleaming tall buildings stand in stark contrast to the muddied waters of the Huangpu River. Indeed, the Huangpu and most of Shanghai's waterways have been heavily polluted for decades. To ameliorate water pollution, the Shanghai government began to focus attention on water quality control in the early 1980s. As Shanghai's economy has grown, the government has been able to devote more resources to protecting this precious resource. In 2002, I conducted dissertation fieldwork[1] in this thriving metropolis to better understand the scope and direction of Shanghai water policies. Prior to my fieldwork, a professor in Shanghai informed me that the private sector played a very minor role in Shanghai water management and protection. He also said the city had no environmental NGOs.[2] With this in mind, I sought to determine if the municipal government has in fact had uncontested power in determining water policies.

Since non-state actors appeared to have no significant impact on governmental water policies, I therefore believed my research would be a simple and straightforward investigation of the municipal government, which appeared to be the sole provider of water services and free to craft water policies.

However, through my interviews it became clear that the Shanghai government's dominance of water pollution control policy in the 1980s and 1990s was waning and political space was opening for non-state actors, such as environmental NGOs and private enterprises. In addition, I discovered that international development agencies, such as the World Bank and the Asian Development Bank, have come to exert influence on the Shanghai government's environmental and natural resource policies by requiring the government to reform its institutions and decision-making policies. The recent picture of Shanghai water politics is not dominated by the government alone, but is instead a very dynamic interaction of domestic and international public and private sector groups.

### *Shanghai Government*

Over the past two decades, the Shanghai government has established water quality targets and regulations in accordance with national environmental policies and standards. For example, the Shanghai government complied with the central government's effort to build up a legal framework to regulate wastewater pollution, by enacting *The Shanghai Combined Sewerage Management Act 1992*. One of the major water conservancy efforts by the Shanghai government was the *Shanghai Huangpu River Upstream Water Source Area Protection Ordinance 1985* (revised in 1990 and 1997). The importance of the 1985 Ordinance lies in the fact that the Shanghai government began to pay more attention to preventive management rather than end-of-pipe engineering solutions to water pollution. (See Box 1).

In addition to local regulations and standards, in the 1980s and 1990s the Shanghai government created a set of environmental protection organizations that have strengthened the city's ability to improve water quality. The organizations include the Shanghai Environmental Protection Bureau, a center for environmental monitoring, and an environmental research institute. The most recent innovative organizational breakthrough in Shanghai water policy was the establishment of the Shanghai Water Authority in May 2000. This authority is an integrated governmental body covering diverse waterworks and projects that were previously dealt with by separate governmental bureaus.[3]

Shanghai policymakers also have undertaken a series of engineering projects related to drainage, sewerage, freshwater supply, and wastewater treatment. One of the most comprehensive projects was the Huangpu River Wastewater Integrated Prevention and Control Planning Process, which was proposed in 1985 and brought about the launch of two separate projects: Shanghai Sewerage Project (1988-1999), and the Shanghai Environment Project (1995-2001).[4]

While these efforts might lead one to conclude that the government was the dominant force in determining water policy, throughout the 1990s the role of private enterprises and international development agencies such as the World Bank and the Asian Development Bank, have pushed forward the Shanghai government's water policy initiatives. While not active in the water sector, environmental NGOs have slowly increased in Shanghai as well. As they become more entrenched in the policy arena (and the Shanghai government becomes more open to their input) the power of these non-state actors to shape water policy will grow.

## Box 1. Shanghai Government's Successes in Water Policies

Beginning in the 1980s, the Shanghai government made some major progress in dealing with the two main water pollutants—heavy metals and organic pollution:

- Shortly after its creation the Shanghai Environmental Protection Bureau (SEPB) gave priority to control heavy metal pollution, and in the early 1980s, SEPB gathered all the electroplating enterprises scattered around the city into a few locations so they could be better monitored.
- A handful of pulp mills, which had been responsible for 25 percent of the biological oxygen demand (BOD) in the Huangpu River, were closed down in the 1980s.
- In order to tackle organic pollution, the food and pharmaceutical industries, which create and discharge concentrated organic effluent, were encouraged by SEPB to adopt pretreatment practices in the mid-1990s.

In addition to these regulatory efforts, the Shanghai government has endeavored to establish and manage a number of sewage treatment plants and sewage drainage networks in the city.

- The Shanghai Sewerage Project Phase I and Phase II have been completed and now treated sewage drains into the Yangtze River and a new freshwater intake point has been chosen in Da Qiao (upstream of Huangpu River) to secure better quality drinking water.
- The sewage treatment rates have risen considerably—in 1991, 74 percent of industrial sewage and 13.9 percent of domestic sewage were treated. By 2000 sewage treatment rates increased to 98 percent of industrial sewage and 50 percent of domestic sewage (Shanghai Environmental Bulletin 1991 and 2001).

### *Private Enterprises*

Prior to the 1980s, water management and policy in China emphasized water supply and flood control needs with little attention given to water pollution control. Under China's socialist economic system, water-related services and supply works were exclusively governmental responsibilities. This top-down water management system, however, did not guarantee an efficient or clean supply of water. For example, in the late 1990s, only 30 percent of municipal wastewater in medium and large cities was processed in treatment plants. Today, the growth of China's sewage discharge is estimated at 2.4 billion cubic meters whereas the capacity of new sewage treatment plants can cover only 300 million cubic meters per year—clearly China's newly established sewage facilities cannot keep up with the growth of sewage discharge. (See Box 2 for details on Shanghai water treatment).

In Shanghai, the weakness of water management and lack of treatment facilities led to the serious water pollution in the Huangpu River and Suzhou Creek. To rectify this frailty, the Shanghai government encouraged a number of foreign enterprises to set up joint venture treatment plants—most notably, the Thames Water's Da Chang Plant in 1996 and Mott MacDonald's engagement in the Shanghai Sewerage Project Phase II in the 1990s.

These pioneering plants laid the groundwork for several events in summer 2002 that opened a new era for the Shanghai wastewater treatment market. Vivendi Water China announced in late May 2002 that the company had finalized a contract with the Shanghai government involving the entire process of waterworks business from water processing to water distribution in the Pudong New Area. Through this contract, Vivendi Water China obtained a fifty percent share of the Shanghai Pudong Water Corporation, and will finance and manage the company. The new name of the company is now Shanghai Pudong-Vivendi Water Corporation.

This new effort to attract foreign investment in the Shanghai water industry seems to be the beginning of adopting more market-driven and cost-effective water projects and policies. The drive to establish economically sensible projects and services in every part of society in Shanghai clearly is influencing the water sector.

In early June 2002, a domestic consortium, consisting of the Shanghai-based Youlian Enterprise Development Company and two other companies (the Youlian Consortium) succeeded in signing a contract with the Shanghai government to establish the Zhuyuan sewage treatment plant. The Zhuyuan plant is the largest sewage treatment plant in mainland China and will be constructed on a built-operate-transfer (BOT) basis. Chinese experts believe that the influx of private investment will solve the financial difficulties in urban sewage treatment and, furthermore, speed up the establishment of new administrative systems for sewage treatment in Shanghai. This is another good example that illustrates that the Shanghai government is committed to promoting private sector participation in the water

industry. While attracting foreign industries has been relatively easy, developing a thriving private water supply and sewage industry will require changes in the city government institutions and reforms in Shanghai's water policies. Possible institutional reforms for the development of private sector participation in the Shanghai water sector include:

- Rationalization of water pricing;
- Greater transparency of policymaking;
- Improvement in the legal and regulatory frameworks—currently the city lacks a uniform supervisory legal system and provisions to facilitate financing for private sector participation in the water sector; and,
- Permission for foreign investors to convert their revenue into hard currency and transfer the revenue to offshore accounts.

However, some policymakers and citizens in Shanghai maintain that such market-driven approaches to treat and manage water could cause social unease, particularly among the poor who cannot afford to pay a sudden increase in water prices. Because ordinary citizens in Shanghai have difficulty conceptualizing the economic value of water, the public could oppose price increases. To promote public confidence in newly privatized water utilities it will be imperative for the government to conduct thorough and careful monitoring of the water pricing. To mitigate tension, the government will likely have to continue some subsidy support for low-income water users, as well as help educate citizens to conserve water. The Shanghai government will have to work to balance the needs of Shanghai citizens for reasonably priced water with the profit needs of the private enterprises. Harmonizing these needs and building the trust of Shanghai citizens in private water industries will demand considerable government time and effort.

### *International Development Agencies*

To understand the evolving trends in the Shanghai water sector, it is important to focus on the contributions from international development agencies. The World Bank has been deeply engaged in a set of major water engineering projects since the early 1980s. Two of most exemplary World Bank initiatives were the Shanghai Sewerage Project (1988-1999) and the Shanghai Environment Project (1995-2001). In each of these projects the World Bank required the Shanghai government to undertake some institutional changes in municipal water service systems. For example, in the Shanghai Sewerage Project, the Shanghai government had to establish the Shanghai Sewerage Company that would operate independently from Shanghai governmental bureaus, and introduce a wastewater charge to provide sufficient revenues for operation and maintenance expenses. In the Shanghai Environment Project the World Bank conditioned the increase of drinking water tariffs by approximately 45 percent from mid-1993 to recover costs and contribute to capital requirements.

## Box 2. Shanghai Water Pollution

According to a pollution source survey in 1985, around 60 percent of the industrial sewage flowed directly into rivers in Shanghai. Untreated industrial sewage was thus the major pollutant of Shanghai waterways. In the 1990s, it was reported that 70 to 80 percent of industrial sewage received sewage treatment, which on the surface would appear a major accomplishment. However, Shanghai's industrial sewage received only pretreatment processing and no primary and secondary treatment, thereby still leaving the city's waterways polluted (see water quality assessments below). While the city has focused on industrial water treatment since 1996, the growth in domestic sewage in Shanghai has outpaced that of industrial sewage. This massive increase in domestic wastewater and the low level of treatment have offset the improvements Shanghai made in treating industrial wastewater. Currently, one of the main concerns in water pollution control in Shanghai is how to regulate and control the increasing domestic sewage. The growth in private sector, multilateral organization, and NGO activity in the water sector may help strengthen the city's capacity to address these growing sewage problems.

***2000 Water Quality Assessments in Points Along the Huangpu River***
*(Class I – Best, Class V – Worst)*

| **Assessing Point** | Dianfeng | Lianjiang | Songpu | Daqiao | Wusongkou | Yangpu |
|---|---|---|---|---|---|---|
| **Water Quality Class** | IV | IV | IV | | IV | V |

*Source*: *China Environment Yearbook (2000)*.

Although these tariff requirements have not yet been successfully implemented, the World Bank's strict criteria and conditions over the years have begun to gradually shift the government's attention from an engineering-centered style of managing water quality to a more cost-effective and market-driven approach.[5] In this context, the government's decision to allow Vivendi Water China to participate in sewage treatment plants and Pudong water service is not a sudden and unexpected outcome but a consequence of the government's two decades of experience with World Bank and other multilateral water projects.

The World Bank (with the blessing of the national leadership) also has chosen Shanghai for a pilot project in water infrastructure financing. Currently, city governments in China are not allowed to issue municipal bonds to fund infrastructure projects. However, under a World Bank project initiated in 2002, local officials in Shanghai created a government corporation to issue a bond to build a wastewater treatment project. *(Editor's Note: For more details see the special report on environmental financing in this publication*)

The Suzhou Creek Rehabilitation Project, funded by the Asian Development Bank, demonstrates another influential role of international development agencies in shaping Shanghai water policies. The Asian Development Bank mandated a new condition for the project—public consultation. According to the project's required environment impact assessment (EIA), the rehabilitation work on Suzhou Creek cannot be undertaken without considering social impacts and educating people who have to resettle about the need to revamp the area where they have lived. It is plausible to argue that the Suzhou Creek EIA obligation will raise the awareness of environmental administrators in the Shanghai government of the importance of public opinion in implementing water projects and policies.

### *Environmental NGOs*

The first Chinese environmental NGOs arose in the mid-1990s in major urban areas. Prior to 2002, however, the few specialized reports and publications on environmental NGOs in China contained no mention of green groups in Shanghai—most of China's NGOs were operating in Beijing and in Sichuan and Yunnan provinces.[6] During my fieldwork in 2002, I crossed paths with some German environmental consultants, who had an impressively wide network of Shanghai environmental NGO activists and were willing to introduce me to key environmentalists.

Amongst the few environmental NGO groups[7] in Shanghai, one of the most influential is the Shanghai Green Union (*Shanghai Daxuesheng Luseluntan*), which has very successfully drawn university students to participate in various environmental protection activities—such as used battery collection and rubbish recycling campaigns on campuses.[8] Another prominent green NGO is the group Grassroots Community, which sponsors regular environmental education discussions and works with the Shanghai government on some community development projects.[9]

In addition to these domestic environmental groups in Shanghai, an array of international NGOs such as the Wildlife Conservation Society, Roots and Shoots, and the World Wildlife Fund are quietly undertaking projects.[10] While some of these international groups use Shanghai as a base for projects outside the city, these organizations are providing education to their Shanghainese staff on the potential role of NGOs in environmental protection.

It is too early to argue that these environmental NGOs have had a great influence on Shanghai water pollution control policies. A number of factors—lack of technical specialization, shortage of funds, low environmental awareness of the public, difficulties in getting legal registration—continue to prevent environmental NGOs in Shanghai and other cities from expanding their activities and exerting a greater influence on governmental policies. However, the growing increase of interest in environmental protection among students and communities (as well as greater requirements of multilateral projects to include public participation in environmental projects) will in due course provide a significant platform for Shanghai environmental NGOs to have a bigger voice in shaping governmental water policies.

### *Conclusion*

My field research revealed that Shanghai's water politics is an increasingly complicated arena in which different state and (domestic and international) non-state actors endeavor to influence policy on water pollution control. The most intriguing result from this fieldwork lies in the identification of the growing influence that private enterprises and multilateral organizations have on Shanghai water policies, as well as the potential power of NGOs. All three non-state forces will be increasingly important in influencing the direction of the Shanghai's water policy in the future. Environmental NGOs can draw public attention to environmental issues and promote awareness among university students and can also encourage citizens to take an active part in public consultation in environmental impact assessments.

The current relationship between the Shanghai government and environmental NGOs is rather blurry. Although most of the activities by Shanghai environmental NGOs are taking place in a legal grey area (because many NGOs have not yet succeeded in registering with the government), it is unlikely that the Shanghai government will crack down on them. This freedom to operate is due to the fact NGOs frequently fill the gaps that environmental bureaus cannot reach—especially the need to increase environmental education among the public.

Private enterprises, such as Vivendi Water China and the Youlian Consortium, can shift the Shanghai government's policies into more cost-effective and rational ways of water supply and pollution control. However, it is important for the government to recognize that such market-driven approaches could result in negative impacts on Shanghai, for instance, public resistance to higher water prices. International development agencies, such as the World Bank and the Asian Development Bank, will be able to encourage and build the capacity of the Shanghai government to develop more efficient water pollution control policies, management techniques, and financial infrastructure.

In sum, the above observations highlight the growing diversity of policy actors in Shanghai water politics and thereby challenge the conventional perception of Chinese local government dominance in policy design and implementation. Instead of being the dominant player in setting water policies and programs, the Shanghai government will be challenged in the new millennium to achieve economic and environmental sustainability through cooperation and bargaining with new players on the stage.

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## Endnotes

[1] The fieldwork was funded by the SOAS Additional Fieldwork Award, the Universities China Committee in London Grant, and the Central Research Fund in the University of London.

[2] Interview with a professor, Geography Department in East China Normal University in April 2001.

[3] The Shanghai Water Authority is a hybrid of different governmental bureaus in the Shanghai government, such as Geology and Mining Bureau, Public Utilities Management Bureau, Water Conservation Bureau, and Municipal Engineering and Management Bureau. Apart from Shanghai, other areas have begun to integrate different water-related governmental bureaus into one organization, such as Inner Mongolia and the cities of Shenzhen and Shijiazhuang.

[4] The Shanghai Sewerage Project was to build new sewage collection and wastewater treatment plants, and the Shanghai Environment Project to move the water supply intake point to upstream of the Huangpu River. To supplement these projects, the Shanghai government announced the initiation of the Shanghai Urban Environment Project in late 2001 as an integrated project covering various urban and environmental issues.

[5] Interview with Professor Gu Youzhi in World Bank China-Shanghai Environment Project Office in June 2002.

[6] See U.S. Embassy Beijing's list of environmental NGOs in China (http://www.sepaeic.gov.cn/NGO/index.htm), *250 Chinese NGOs – Civil Society in the Making* published by China Development Brief, and the inventories of environmental work in China in the *China Environment Series* 1-5.

[7] Following Elizabeth Knup's classification of green groups in China (*China Environmental Series,* 1997) in Shanghai the environmental NGOs can be categorized as "voluntary organizations." These NGOs do not usually have any close political connection with the government, do not secure sound and continuous funding, and are loosely organized based on student and/or community members who lack technical expertise.

[8] Similar activities are done in elementary schools and communities by middle school students who run the Shanghai Youth Environmental Society.

[9] Recently this group became one of the first Shanghai NGOs to register with the government as a branch of the Shanghai YMCA. For more detailed information about this group, see the commentary by Fenshi Wu in *China Environment Series, Issue* 5, 2002.

[10] Interview with Shanghai project coordinator in the China Green Student Forum in May 2002 and interview with China representative in the Wildlife Conservation Society (WCS) in June 2002.

# Community Forestry in Yunnan Province

*By Kenji Kitamura and Guangxia Cao*

Widespread intensive agricultural development is regarded as one of the major causes of severe natural resource degradation in China. In order to expand farms, local people have cleared forests on hills and mountains in many rural parts of China. Deforestation, particularly in southwest China, has caused a number of immediate and cumulative problems such as soil degradation, desertification, floods, water contamination and siltation.

The severe 1998 floods of the Yangtze and other rivers triggered central government policies prohibiting the logging of natural forest in watershed slopes exceeding 25 degrees in grade, promoting the conversion of sloping fields back to forests, and expanding afforestation projects. These quick policy pronouncements in response to the environmental crises have had problematic impacts—these new forest policies somewhat challenge the government's continued prioritization of agriculture to feed its huge population. Moreover, in the midst of forestry policy shifts and debates, poverty worsens in many rural areas of China where logging has been banned. Indeed, it is not an overstatement to say that land use in China's rural areas is a highly complex and challenging issue.

China, like all countries, needs strict national regulations to combat serious environmental problems. However, local needs must be addressed simultaneously in order to create long-term solutions to the underlying causes of natural resource degradation. In other words, to balance larger environmental goals with local needs other strategies besides top-down, "one-size-fits-all" pronouncements are necessary. One strategy to give local voice to environmental problems is the community-based management approach. The "carrot and stick" maxim captures the essence of this approach. The logging ban, for instance, is a "stick"—a top-down, restrictive approach by the central government that is not always welcomed by local communities, especially by those whose user rights are limited and livelihoods threatened. Some of the goals of such top-down initiatives could be improved if "carrots" existed giving incentives for local people to change their behavior.

In China, one example of a "carrot and stick" community-based approach to solving forestry degradation can be found in a social forestry project in Yunnan province, which was undertaken in the early 1990s by the provincial Forestry Department with support from the Ford Foundation. In this commentary we review the project with information obtained from existing documents (Cao, 1999; Evaluation Group, 1998) and a field survey we conducted in 2001.

### *Evolving Land Rights in China*

Under the agricultural household responsibility system initiated in the late 1970s and early 1980s, land use rights were given to individual farmers in rural areas of China to create incentives for enhancing agricultural productivity. Apart from the tax paid in the form of delivering a specific amount of crops to the state, farmers could benefit economically from working harder, adopting more effective growing techniques, and using the land responsibly. Although land ownership remained communal, farmers had confidence that the user rights would be maintained over the short term. Food production in China increased significantly in the 1980s and early 1990s.[1]

The successful agricultural tenure reform was followed by a similar forestland use policy in the mid-1980s, which aimed to promote reforestation efforts and better forest management. This new policy gave people user rights in forests, but brought an unintended result—to earn quick cash, farmers cut down *more* trees than they planted. This rush to cut trees stemmed in part from skepticism regarding the longevity of the forestry tenure policy, therefore local villagers considered it wiser to cut trees before the policy was revoked. This suggests two necessary conditions for forestland tenure policy to be a successful forest conservation strategy. The first would be to guarantee long-term and secure land use rights to individual villagers. Secure land use tenure is especially important for forestry, since forests generally require a much longer period of time to produce a profit. The second would be a mechanism supporting forest management that is technically, socially, economically, and environmentally appropriate. Such a mechanism might include training, economic assistance, and information exchange to promote more sustainable forestry management practices.

### *The Social Forestry Project in Yunnan*

The main objective of the social forestry project sponsored by the Yunnan Forestry Department and the Ford Foundation has been to make land use meet the needs of both the local government and communities. The project,

implemented in two phases (1993-1998 and 1999-2003), has aimed to: (1) increase forest protection and restoration; (2) mitigate poverty; (3) reduce land use conflicts among the agricultural, animal husbandry, and forestry sectors; (4) build the capacity of local communities to sustainably manage forests; and (5) create a partnership between government forestry officials and villagers.

This social forestry project targeted four villages in Yunnan province, which were selected based on their location in the Jinsha River watershed, an upper branch of the Yangtze River. Two villages were in the upper reaches, one in the middle, and the other in the lower reaches of Jinsha. All experienced widespread deforestation, and are therefore included in the national government's Yangtze River Shelterbelt reforestation program. The social forestry pilot projects helped to address effective ways to reforest the watershed for the shelterbelt program.

**When local people are dependent on [the] natural environment for their livelihood, their participation in protecting the resources will be a means, rather than an obstacle, to conservation.**

The project is designed to involve several levels of governments. At each project site, the provincial forestry department is the principal body of authority while county forestry bureaus supervise the implementation of project activities. At the site, the village committee coordinates the interests and activities of individual villagers. The social forestry project organizers required the creation of two special liaison positions in order to integrate more efficiently the top-down county work with the village activities. The county employed an extension officer to work closely with the village and the village elected a liaison representative as a counterpart of the county extension officer.

Among the four pilot project sites, we examined the implementation of the village Banliu, because it was a project that showed considerable institutional innovation in project implementation. Banliu village had 2,094 residents in 527 households at the end of 1993. The main sources of income were tobacco production and animal husbandry, which did not provide stable income for most villagers, so sustainable agro-forestry offered a possible way to strengthen economic security for the village. The social forestry project formally commenced in 1993 after a few years of preparation and planning.

The project was the catalyst for a landmark event in the village—the auction of community-owned wasteland to individual villagers in 1994. User rights for over 3,000 *mu* (1 *mu* = 1/15 hectare) of wasteland were transferred to about a quarter of the total households in the village. Following the model of forest management by user groups in Nepal,[2] the Yunnan social forestry project helped villagers form small groups to implement project activities to sustainably develop the land. Six groups were formed to discuss land use options, exchange technical knowledge, and facilitate financing. In addition to the membership fees collected, the groups received funds from the Yunnan social forestry project for collective benefit activities like bee keeping.

The main project activity of all the groups was reforestation of the wasteland to fulfill goals for both forestry conservation and timber supplies for villager use. In addition to the introduction of agro-forestry projects, the local forestry department offered farmers training on seedling cultivation, planting and pruning. To strengthen agro-forestry initiatives, farmers were also given a chance to visit other prefectures to learn advanced forestry management and cultivation techniques. The pilot project saw tangible results in Banliu village, including:

- Increased forest cover from 18 percent in 1993 to 30 percent in 1998;
- Improved forestry management techniques and increased tree varieties;
- Average income nearly doubled;
- Improved quality of life by supplying clean drinking water in newly created reservoirs; and,
- Decreased wood for fuel by providing more efficient and less polluting stoves to each household.

The Yunnan provincial government and Ford Foundation project evaluation report for the initial phase (1993 - 1998) acknowledges the valuable role of the extension officer in the Banliu case. This extension officer not only helped villagers with developing new techniques in forestry management, but also with other social needs (e.g., water supply and clean cook stoves). While the project started its second phase in 1999 with a different

extension officer and village representative, our field survey in 2001 found that this liaison mechanism continued to be effective, which indicates that the previous pilot project helped create a new and successful liaison institution. There is no doubt that mutual trust and sound communication between the county and the village contributed to the successful outcome of the project. The project also created institutions that allowed input from the community, which motivated villagers to actively participate in the afforestation project. This local participation guaranteed successful project activities that met the needs of the community.

***Community-based Approach: Carrot and Stick***

Reflecting on the implications of this case, it is worthwhile to return to the "carrot and stick" maxim. A commonly used conservation strategy is the designation of a protected area, which sometimes requires governments to employ a "stick" prohibiting access and use by local residents. However, such a strategy may motivate local residents to defiantly encroach on the reserve. Alternately, incentives could be introduced to offer benefits to local people for protecting the conservation area. There is a risk that an overemphasis on opportunities to profit from protected areas may lead to overexploitation of natural resources, as Glacy (2002) documented in his study on the promotion of ecotourism in Chinese nature reserves.

While incentive-oriented community forestry projects and protected areas policies are markedly different conservation strategies, they could be combined to reach broader conservation goals. At the operational level, the Yunnan project adopts the "stick and carrot" approach by establishing groups in the village to facilitate and check forestry protection implementation, while still including local government monitoring and power to protect the sites. The government wields a smaller stick and villagers are motivated by carrots to make profits through growing fruit trees and cash crops.

The Yunnan social forestry project succeeded because when local people are dependent on natural environment for their livelihood, their participation in protecting the resources will be a means, rather than an obstacle, to conservation. Another unique aspect of the project was that the forestry project sites were not designated as a strict nature reserves, but as a protected watershed that is linked to local economic and quality of life interests. The strength of this type of forestry conservation initiative is that it can be applied in areas without significant biodiversity or aesthetic conservation value. Such community-based forestry projects can enhance the ecological integrity of protected reserves by being applied to conserve the environment of areas outside the reserve boundaries—they could contribute to environmentally benign management of buffer zones and improved connectivity of "island" parks.

***Institutional Arrangement***

While most of the authority to design and implement environmental policies in China remains within the government sphere, absent of much public participation, there still exists the possibility for grassroots initiatives. The increased decentralization of power combined with the local two-layer natural resource ownership structure—collective land ownership and individual use rights of land—creates opportunities for projects like the Yunnan social forestry project to create innovative local resource use arrangements.

By connecting collective property rights and individual use rights, the Yunnan social forestry project adopted an institutional arrangement that clarified the benefits and costs of conservation for local government and community stakeholders. Our survey of the Banliu village points out three key factors for success in forestry conservation projects: (1) long-term, secure land use tenure, (2) effective incentives for villagers, and (3) efficient and transparent institutional arrangement (such as the liaison persons to link user groups to government organizations).

To promote successful community-based resource management several conditions must be met. At the macro level, for example, state policy must remain stable to promote confidence in the "two-layer" natural resource tenure structure. At the micro level, community organization and local leadership must be strong.

The Yunnan project presents new opportunities for approaches that integrate conservation and development goals at the community level and is a model applicable to other parts of China. Foreign donors and international NGOs could play an important role in promoting such community-based initiatives by offering financial and technical support. Over time such internationally supported projects will eventually be able to act as models for other areas to imitate around the country.

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[1] For a discussion of current challenges facing farmers and food production see Jessica Hamburger. (2002). "Pesticides in China: A growing threat to food safety, public health and the environment." *China Environment Series*. Woodrow Wilson Center. 29-44 and in World Bank. (2001) *China: Air, Land, and Water: Environmental Priorities for a New Millennium.*

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# Coastal Zone Management in the People's Republic of China: A Unique Approach?

*By Maren Lau*

China's 18,000-kilometer coastline encompasses a region of great economic importance to the country, accounting for about 56 percent of its GDP (Wang, 1992).[1] Swelling populations and an unbroken trend of urbanization throughout the east coast increasingly challenges the conservation of China's vast coastal zone. While the Chinese government has begun to recognize the crucial role the ocean's living and non-living resources play in China's energy and food security, balancing economic growth with the need to protect marine resources calls for a more sophisticated and better coordinated coastal management system than China currently employs.

Currently, China's coast is divided into twelve administrative units.[2] Such fragmentation creates many obstacles to establishing more coordinated management approaches such as integrated coastal zone management (ICZM), which aims to promote sustainable development of coastal areas by taking into account social and economic issues, as well as environmental protection. According to the World Coast Conference (National Institute for Coastal and Marine Management, 1993) and the United Nations (ESCAP, 1995), key criteria for successful implementation of ICZM are: (1) coordinated legislation, (2) efficient institutional organization, and (3) a high degree of public participation. While democratic countries can more easily fulfill these ICZM criteria, countries like China with a one-party state and partially reformed political system may lack the necessary transparency and public participation preconditions. Nonetheless, with modifications ICZM still could be implemented.

In the People's Republic of China, the slow government bureaucracy—a legacy of Communist political reality—and the continued reliance on relation-networks (*guanxi*) often stymie the creation of complex policy solutions like ICZM. One of the key reforms to help create more efficient policymaking in China has been the decentralization of political, administrative, and economic power over the past twenty years, which has stimulated economic growth and strengthened local governments. Central and local governments can be, as is discussed below, both obstacles and catalysts for successful ICZM in China, therefore it is crucial for the Chinese leadership to harmonize top-down and bottom-up conservation and development initiatives to sustainably manage the country's coastal zones.

### *Central Government Institutions and Initiatives*

Over the last decade, the Chinese government has made a significant effort in developing legislation for the coastal zone. Nonetheless, a Coastal Zone Management Act is not expected until 2005.[3] In the meantime, the recent Sea Area Use Law (*Haiyu shiyong guanli fa)*[4] creates an opportunity for more sophisticated coastal management in terms of functional zoning and sustainable financing.

The leading agency for ICZM in China is the Department of Sea Area Management situated within the State Oceanic Administration (SOA),[5] which is an agency subordinate to the Ministry of Land and Natural Resources (MLNR). With more than 40 years of history, SOA's longevity indicates acceptance within the political hierarchy. Newly developed agencies often do not have a strong standing within the government and party hierarchy and lack the necessary *guanxi* to be taken seriously by the more powerful agencies. A good example of a new agency that had to struggle for acceptance—although it had support from the highest national level—is the National Environmental Protection Agency.[6] It only slowly gained power after being restructured in 1998 as the State Environmental Protection Administration (SEPA) and given ministerial status directly under the State Council. Reflecting on SEPA's experience, it may have been a sensible for the Chinese government to put SOA inside an existing agency instead of introducing a new independent agency without history and *guanxi*, and therefore with a weak political standing.

In addition to examining SOA's political power within the government hierarchy, it is important to consider whether this agency's mandate and expertise can carry out ICZM to meet international standards. Most countries use ICZM to address multi-user conflicts of allocating resources or spatial disputes. Thus, the ICZM concept emphasizes the coastal zone as terrestrial with significant land-ocean interactions—encompassing a variety of coastal sectors such as agriculture, industry, fisheries, tourism, urban planning, construction, port, and trade activities.

In choosing SOA as a leading agency for ICZM, the Chinese government made an important decision towards emphasizing the ocean part of the coastal zone. The strong marine mandate of SOA means it does not have the authority to coordinate all affected sectors. In other words, while prioritizing coastal water issues through purely scientific and marine expertise (e.g., emphasizing pollution or economic considerations of marine resources) SOA may neglect coastal issues on the shore and limit the participation of environmental, economic, agricultural and other agencies. Such a narrow institutional set-up counteracts sustainable development and policy integration in the coastal zone and means that China is not adopting the comprehensive international standards for ICZM.

**The Xiamen experience also hints how the private sector, nongovernmental and academic communities will increasingly become an instrument for raising awareness among the government *and* general public.**

***Innovation at the Local Level***

During September 2002, I had the opportunity to participate in a workshop on ICZM in Xiamen, which was organized by Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) and its Regional Network of Local Governments in South-East Asia (RNLG). In addition to interviewing conference participants I had insightful conversations with scientists in Shanghai universities and their political counterparts in the State Oceanic Administration. My recent research in China showed that while the central government policies and institution building is creating the foundation for a functioning ICZM framework, some local governments are attempting different approaches to promote sustainable coastal development. In addition to examining local-level coastal management trends, I highlight below the varying success of ICZM attempts at the local level by comparing efforts in Shanghai and Xiamen.

Local laws and regulations for coastal management and protection are limited, but stronger in areas with local governments pursuing a truly comprehensive ICZM approach. In the long term, the national government expects local coastal management initiatives to cover the whole coast. One particularly promising regional attempt to coordinate marine legislation was the Bohai Sea Project. With support from the Global Environment Facility (GEF) all provinces and municipalities bordering the Bohai Sea signed the Bohai Sea Declaration in 2000. Participation in this declaration signifies they accepted the obligation (and need) for inter-jurisdictional cooperation to restore and protect the environment. In the case of Bohai, inter-jurisdictional cooperation was inevitable as too many administrative units were damaging water quality and overexploiting coastal resources. This initiative was clearly generated by the central level; but the central government does not appear to be pushing inter-jurisdictional cooperation in other coastal areas. Functioning regional efforts such as the Bohai project are still rare, while some areas—such as Xiamen—are making advances in coastal management.

*ICZM in Xiamen*

The seas along China's coasts are divided into three regions—the Northern Sea (*Beihai fen*), the East China Sea (*Donghai fen*), and the South China Sea (*Nanhai fen*)—each of which has its own regional SOA branch. At the provincial and local level there are various agencies that oversee marine and coastal issues.[7] However, Xiamen is the only local government that explicitly has an office for ocean management. This is no surprise as Xiamen is also the only area where a local version of ICZM has been implemented comprehensively in China. Xiamen's ICZM program is empowered by a coordinating committee situated directly under the mayor and the committee has tried to involve all affected sectors in coastal management efforts.

Xiamen's unique ICZM initiatives stem, in part, from an upper-level catalyst—in 1994 Xiamen was selected as a national demonstration site (with multilateral support) for the implementation of a five-year ICZM program.[8] In the beginning, the program focused on marine pollution prevention and the gradual establishment of effective coastal management institutions.[9] In setting up their program the Xiamen municipal government emphasized the interaction of scientists and decision-makers, which led to the creation of an advisory group of marine scientists, legal experts, economists, engineers, and urban planners to provide their expertise to local policymakers. The advisory committee has helped the

Xiamen government incorporate scientific tools into coastal management policy—such as the Integrated Environmental Impact Assessment (IEIA), which was introduced to prevent unfavourable ecological and socioeconomic impacts of planned development projects. After adopting IEIA, coastal reclamation plans with negative consequences—such as accelerated erosion, siltation in drainage outlets, and the loss of fish grounds—were reassessed. Based on one IEIA, a marine zoning scheme was developed to include a water-use permit system to promote water conservation.

In Xiamen, ICZM has been successful, due to the admission of failures and efforts invested to reverse them. Consider, for example, the case of Yuandang Lake within Xiamen. This lake used to be a natural fishing harbor but it was cut off from the Western Sea by the construction of a causeway to reclaim land. Due to urban expansion more wastewater was discharged untreated into the lake and this water pollution endangered the surrounding ecosystem. This pollution disaster was gradually reversed through a ten-year treatment project including: (1) a reopening of the lake to the sea allowing water exchange, and (2) an urban development plan for turning the surrounding area into a recreational zone.

*Shanghai Coastal Management*

In contrast to the successful integration of coastal management in Xiamen (Yu, 1997), the coordination of scientific institutions and political administration in Shanghai is still in the initial phase (Shi et al., 2001). For example, while marine and coastal scientists acknowledge the threat of sea-level rise to the city and urban planners consider the issue, all of these experts must await approval from local policymakers to take action.[10] Notably, the political administration does not yet recognize sea-level rise as an immediate danger and instead emphasizes the successes achieved in stopping the city's subsidence due to over extraction of groundwater. However, voices among the scientific community still warn that increasing heavy building construction may reverse the measures taken ten years ago to stabilize the groundwater table. While official propaganda states heavy building construction has been limited, an examination of Pudong and other parts of the city along the Huangpu River suggests the contrary. Clearly, poor coordination and communication between the marine scientific and policy communities has negatively impacted Shanghai's coastal management capability. Xiamen resolved such a lack of coordination through the establishment of the office of ocean management advisory group. In Shanghai, a comparable ICZM institution is not currently in place, but is planned for the near future (Shi et al., 2001).

While the local government of Xiamen pursues an innovative ICZM approach, in other areas coastal management attempts are sometimes constrained by inadequate coordination with neighboring provinces. For example, SOA representatives informed me that some provinces and cities dispute coastal zone boundaries. In fact, Shanghai is a potential source of conflict, for the city stretches its territory into bordering areas through the construction of bridges to coastal islands and pipelines on the sea ground. Such huge projects also raise questions of possible negative impacts on the coastal ecosystem, as well as economic and environmental loss to the bordering regions. With its sustained economic power and financial capacity, Shanghai is in a position to continue to infringe on its neighbors with such coastal development projects. However, Shanghai policymakers are making an effort to fulfill the national requirements for ICZM by formulating regional laws, introducing functional zoning, and improving environmental conditions of its coastal waters. Due to a lack of cooperation on a regional and inner-municipal level, these efforts are tempered. Additionally, the Shanghai municipal government tries to keep its structural independence from the SOA in order to prevent it from becoming too powerful.

***The Need to Involve Stakeholders***

Public participation in policy development and implementation is a new concept to Chinese central and local policymakers, but some government officials are beginning to raise public awareness of policy issues. Such changes will be crucial if China is to promote effective integrated coastal management. Key to ICZM is the involvement of all affected stakeholders—the general population, trade unions, nongovernmental organizations (NGOs), and private businesses. It merits mention that stakeholders in China, especially NGOs and trade unions, are rarely acting independently of the party or government. The power of businesses (both private and state-owned) is dependent on their size, as well as the discretion of local policymakers, who are often involved in their management. NGOs, trade unions, and businesses thus represent *tools* of the government and do not yet reflect an independent stakeholder input, which is a crucial component for ICZM to meet international criteria. Nonetheless, even with limited independence, these groups may have a positive impact on implementation of coastal policies.

Some local government agencies have been active in trying to raise public awareness of marine issues. Xiamen, for example, developed a marine educational program

for students from kindergarten to university. The program even includes special training opportunities such as a summer university, in which older children tutor younger ones about coastal issues. In terms of raising awareness among adults, the Shanghai branch of SOA emphasizes the importance of the national government's annual ocean festivals. Unfortunately these events only take place in one coastal city each year and have not sparked local governments to create similar awareness-raising festivals.

As the ocean festival and Xiamen summer school initiative show, there are indeed innovative public education initiatives taking place at both the national and local level. In the long run, if public and NGO participation in coastal policy development increases, ICZM in China could become better coordinated and comprehensive.

### *Harmonizing Central and Local Initiatives*

The national SOA plans to adopt experiences from successful local ICZM projects, such as Xiamen, and gradually implement them in other regions along the coast. This strategy harmonizes central and local initiatives, so ICZM in China will be partly centrally controlled and implemented top-down and partly initiated bottom-up (and thus defined by local governments). This power-sharing model has been used successfully in other policy sectors as China's economic and political reforms have progressed over the past twenty years. While China's distinctive top-down and bottom-up ICZM approach has little public participation and does not yet completely meet international ICZM criteria, a foundation is being established. In Xiamen—where ICZM was both a top-down and bottom-up creation—policymakers accepted input from outside experts and realized that utilizing ICZM would strengthen economic development. The Xiamen experience also hints how the private sector, nongovernmental, and academic communities will increasingly become involved in coastal management and could become an instrument for raising awareness among the government *and* general public. To protect the country's vulnerable coastal resources, Chinese policymakers should evaluate the Xiamen model and try to spark local initiatives and broaden commitment to marine conservation.


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## ENDNOTES

[1] The overall coastline expands to 32,000 kilometers when the approximate 6,500 islands that the People's Republic China claims sovereignty over are included (Han, Hou, & Wu, 1995).

[2] This zone encompasses eight provinces, two municipalities, one autonomous region, and one special administrative zone.

[3] In a personal interview one SOA official estimated such an act should emerge in 3 to 5 years.

[4] This law was passed 27 October 2001 and went into effect on 1 January 2002.

[5] Other departments of SOA cover marine environmental protection, international cooperation, science and technology.

[6] Prior to March 1998 the National Environmental Protection Agency only had a sub-ministerial status, subordinating it to all ministries and provincial governments.

[7] Every coastal province or municipality has either an oceanic administration (Hebei, Tianjin, Shanghai, and Guangxi), a department of ocean affairs and fisheries (Liaoning, Shandong, and Hainan), or a bureau of oceanic affairs and fisheries (Jiangsu, Zhejiang, Fujian, and Guangdong). Additionally, the cities of Dalian, Qingdao, Ningbo, and Xiamen have their own local marine administration.

[8] This effort was part of a GEF/UN Development Programme (UNDP)/International Maritime Organization (IMO) initiative.

[9] SOA introduced in Xiamen the first truly comprehensive ICZM framework to local government structures.

[10] In China, urban planners and researchers are participating in scientific advisory groups or committees, but ultimately their input depends on the approval of political decision-makers. In contrast, in Europe and North America preparing new coastal developments for sea level rise is typically within the discretionary power of local planners over design and budget.

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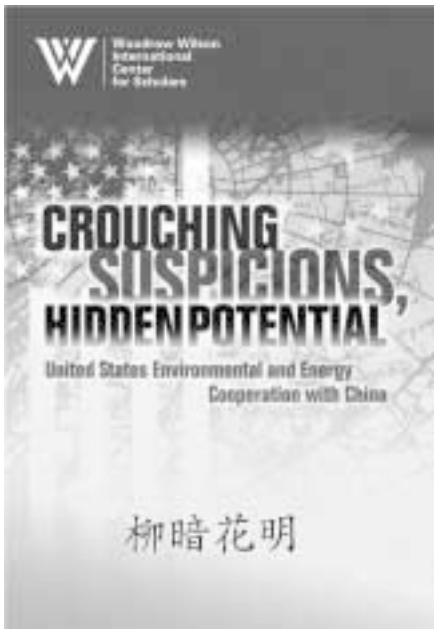
## CROUCHING SUSPICIONS, HIDDEN POTENTIAL: U.S. ENVIRONMENTAL AND ENERGY COOPERATION WITH CHINA

**By Pamela Baldinger and Jennifer L. Turner**

China already consumes more energy and emits more greenhouse gases than any country except the United States. Moreover, China's recent breakneck pace of modernization already has left it with nine of the world's ten most polluted cities. Northeast Asia is beset with acid rain from China's sulfur emissions, and even countries halfway around the globe are feeling the impact of China's pollution problems and inefficient use of natural resources. Thus, China's energy and environmental policies have an enormous impact on the United States and the rest of the world. Yet energy and environmental issues have not played a prominent role in U.S.-China relations.




The ECSP/China Environment Forum publication, *Crouching Suspicions, Hidden Potential* (2002), succinctly summarizes U.S.-China cooperation in the areas of energy and environmental protection. It highlights opportunities for U.S. policymakers, business, and nongovernmental organizations to further such cooperation; it also analyzes barriers to present and future cooperative efforts.

To obtain a copy of *Crouching Suspicions, Hidden Potential*, contact ECSP Senior Project Associate Jennifer L. Turner at chinaenv@erols.com or 202/691-4233.

# What if All China Golfed? Prospects for an Environmentally-Friendly and Conflict-Free Golf Industry in China

*By Timothy Hildebrandt*

In a 1996 *Sports Illustrated* interview discussing his ethnicity, Tiger Woods—arguably the greatest professional golfer of all time—declared that he was "mathematically Asian." If current trends continue over the next decade, the same could be said for the sport of golf. With exciting young players like Woods and Asians like Se Ri Pak dominating the game, golf's popularity in Asia (excluding Japan[1]) has jumped from 1.5 million golfers in 1990 to over 3.8 million just eight years later. Industry analysts expect to see an additional doubling in growth: Outside of Japan, Asia will likely be home to seven million golfers by 2008 (Lee, 2001).

Regardless of expanding interest in the game, however, new players will only materialize if the region constructs more golf courses. In the late 1990s, the ratio of golfers to golf courses was quite high; Asia's nearly 25 million golfers played on only 4,300 courses (5,800 golfers per course) while an equal number of American golfers had their pick of 15,900 courses, a ratio of just over 1,600 golfers for each course (Capell & Lindorff, 1997). Though the number of courses in Asia is increasing significantly, the region's golf course industry remains underdeveloped.

Developers the world over have identified Asia as the greatest growth area for golf course construction. Led initially by Japanese companies, course developers from the United States and Europe were first lured to Southeast Asia countries like Thailand and Malaysia by the promise of beautiful tropical weather and plentiful, cheap land. Even countries that previously banned golf as a "decadent sport of western imperialists" have constructed their own courses—Vietnam, for example, is now home to eight courses. It was perhaps only a matter of time before developers set their sights on the greatest prize of them all: China.

***If you could you sell a golf ball to everyone in China…***

While China entered the golf business more slowly than its neighbors—years behind Southeast Asian nations and several decades after Japan fell for the game—it is poised to play a much larger role in the golf industry in Asia and worldwide. By the end of 2004, China is expected to be home to 100 golf courses (Capell & Lindorff, 1997). Though a relatively small number, with an immense urban population growing wealthier and more westernized, the possibilities for further growth are nearly endless.

Worldwide, golf is more than a sport; it is very much an industry. In Japan alone, golf has contributed as much as $14 billion a year to the national economy (*The Economist*, 1997). As the game's popularity continues to grow and more courses are built, the industry is certain to contribute even more to Asian economies. Golf revenue could help the struggling Asian tourism industry offset problems caused by slowing economies, terrorism, and, most recently, SARS.

Golf is, seemingly, a windfall for all involved—wealthy businessmen have the opportunity to learn the sport that is still part of doing business in the West, developers are poised to make great amounts of money, and local economies can benefit from increased tourism. However, the exponential growth of golf and the demand for golf courses pose a great many problems to the environment. Disruption to the natural ecology—marked by the introduction of non-native species, heavy water demand, and the use of harmful chemicals—is just one of the consequences of golf courses. Additionally, the effort to make these courses beautiful has resulted in disturbing health effects. In many countries, residents who live near these courses, while not golfers themselves, have experienced the greatest share of these effects and, in several instances, these residents have made their dissatisfaction known. While protests and conflicts have plagued many courses throughout Asia, China, which will likely see a dramatic increase in new golf course construction, has an opportunity to create a more sustainable industry.

The example of ecological damage, adverse health effects, and social unease set by its Asian neighbors is a reminder of what can happen if China does not closely control golf course construction. In addition, Chinese developers could draw from the experience of their counterparts in the European Union and United States who have devoted considerable resources into researching techniques to reduce the ecological footprint of golf courses. Perhaps most importantly, China has the institutional capacity to avoid the fate of its Asian neighbors. China's powerful one-party government has

the capability, as shown by the 2008 Olympics, to devote tremendous resources to resolve environmental problems, provided it has the desire.

Which image of green golf will China choose? Will China recreate courses that simply look green as their Asian neighbors have done? Or, will Chinese developers and regulators choose truly green construction that takes into consideration ecological balance, the preservation of natural resources, and social harmony?

### *Water Hazards*

In *Green Menace,* a Thai documentary film that exposed the environmental implications of golf course construction in Asia, golf legend—and course developer—Jack Nicklaus showed little concern for the water consumption of his golf courses in Thailand, declaring that the country had "plenty of water…Certainly [Thai courses] don't have [water] problems from our standpoint"(Traisawasdichai , 1995, p.2). Nicklaus' statement serves as an example of the common ignorance of the toll taken on water supplies by golf course construction and maintenance. Not surprisingly, the home to the world's highest number of golf courses—the United States—was recently ranked the number one worldwide wasteful water user at the Third World Water Forum in Kyoto (Sutherland, 2003). The high consumption is partly due to the country's love of golf. Conservative estimates suggest that 3,000 cubic meters of water are needed daily to maintain an 18-hole golf course in the United States—the same amount of water is sufficient to meet the daily needs of 15,000 people (*The Economist,* 1997). Water wastage on golf courses is far worse in some Asian countries.

A study by Mahidol University in Bangkok found that, on average, Thai courses use nearly 6,500 cubic meters of water per day, enough water for 60,000 rural villagers (Traisawasdichai, 1995). To quench the thirst of their courses, in Thailand some golf course managers dump rocks and fill in nearby rivers in an effort to raise the water level and divert the flow to irrigate the grass. In Mr. Nicklaus' *Green Menace* interview, he maintained that Thailand's high rainfall made concerns of heavy water use irrelevant. However, golf courses have less than a quarter of the water retention capacity of forested areas, which makes it difficult to rely on rainwater. Thus, while rainwater may fall regularly, most of it runs off—not only does the course lose this natural irrigation, but also downstream areas are more easily flooded. During the construction of courses natural vegetation is stripped, leaving the land vulnerable to heavy erosion, which often makes nearby rivers and lakes useless for local communities (Takeda, 1996).

### *Irreplaceable Divots*

Perhaps the best-known environmental impact of golf courses around the world is from the use of pesticides. The heavy dependence on chemicals to maintain the green look of golf courses and support non-native grasses has been the focus of many environment and health studies. In 1995, a New York Department of Law report on chemical use in local golf courses found that the typical 18-hole golf course uses seven pounds of dry and liquid chemicals per acre per year, seven times the amount used by large-scale agriculture.[2] These quantities could be even higher in countries, such as China, where pesticide regulations are weaker and enforcement nearly nonexistent.[3]

High pesticide use has clear effects on the ecology of areas surrounding golf courses. A Canadian study of lake sediment in and near courses found mercury levels well beyond government standards; predictably, fish and other aquaculture in these lakes contained dangerously high levels of mercury (Takeda, 1996). Though few studies of Asian courses exist—the silence tells a story in itself—one particular experience in Japan suggests that Asia faces similar, if not more acute, toxic problems. On the Japanese island of Hokkaido, golf course managers used organic copper compounds to keep non-native grasses from rotting. The runoff reached nearby lakes, killing over 90,000 fish (Chatterjee, 1993).

Fish and other aquaculture are not the only victims of pesticide use on golf courses. While the direct link between pesticide use on golf courses and long-term health effects is still inconclusive, studies suggest that elevated rates of human health problems near golf courses are not merely coincidental. The industry itself has raised concerns about carcinogen-laden chemicals used in course maintenance. The Golf Course Supervisors Association of America, a trade group representing 22,000 golf course managers in the United States, expressed concern that its members have an unusually high rate of lung, brain, large intestine, and prostate cancers. A University of Iowa study of 618 golf course superintendents in the United States validated the Association's concern, finding elevated levels of cancer in the study subjects (*PSR Reports*, 1999). Additionally, some members of the Ladies Professional Golf Association have questioned the safety of their "workplace."

While there have been no substantive studies examining the threats golf courses pose to human health,

fears have been expressed by communities near courses. In Thailand, some rural residents have claimed that herbicides used in local golf courses contain the same toxic chemicals found in Agent Orange (Walsh, 1997). Even if slightly misinformed, their concerns reveal that a culture of fear and distrust exists among many citizens living near new golf course developments in Asia.

***Social Elitism or Environmental Inequality?***

Growing discontent throughout Asia over the burgeoning golf industry has given rise to the creation of numerous groups devoted partly, if not solely, to opposing golf in the region. Groups like the Asia Pacific People's Environmental Network (APPEN) and the Global Anti-Golf Movement (GAGM) have been particularly loud in their denunciation of golf's growing popularity in Asia.[4] Some in Asia see golf as a symbol of the growing disparity between rich and poor—despite the expected growth of the industry, the vast majority of the region's population will never step foot on a golf course, let alone grab a club. The elitist image of golf throughout the game's long history feeds the growing discontent expressed by citizens. Yet, opposition groups would have hardly a leg to stand on if they limited their criticism to the game's contribution to "social elitism." Thus, as part of their manifestos, groups like GAGM and APPEN note that golf development is "one of the most unsustainable and damaging activities to people and the environment." (Walsh, 1997, p.1). The Asian Human Rights Commission noted environmental degradation in its 2001 Charter:

> Our governments claim to be pursuing development directed at increasing levels of production and welfare but our natural resources are being depleted most irresponsibly and the environment is so degraded that the quality of life has worsened immeasurably, even for the better off among us. [5]

The Charter singled out the environmental degradation associated with the growth of golf, because it has a disproportionate impact on poor, rural residents. Indeed, golf's push into Asia appears to be an example of environmental inequality.

Although some professional golfers have cited pesticide exposure as the cause of health problems, it is primarily poor residents who are bearing the brunt of golf's side effects. Because of weak regulations and local populations ill equipped to oppose development, golf courses are increasingly moving into rural areas of Asia. In an interview with the newly created Asian Professional Golfers Association, the head of one golf development firm proudly stated, "some…golf courses…were located in poor villages 30 years ago. But today, due to these thriving golf courses, these villages have transformed into modern townships. I'm proud of it" (Xu, 2003). In a very different analysis of development, Jim Gilchrist of APPEN contends that golf course development in Asia has "displaced Japanese agriculture workers, created landless poor in Thailand and stricken Malaysia with water shortages and cholera" (Gilchrist, 2000).

**The 2008 Olympics offer a glimpse at the government's power to affect environmental change.**

Governments eager to bring in tourist dollars have made golf course development easy for investors, but often to the detriment of local populations. Friends of the Earth Malaysia reported that in the early 1990s the Malaysian government paid more than 7.5 million dollars for a pipeline to feed clean water to a golf course resort on Redang Island. Yet, just across the water in the mainland city of Terengganu, a cholera epidemic broke out due to a lack of clean water (Chatterjee, 1993). During a drought in 1994, Thai government officials reportedly turned a blind eye to 13 golf courses that illegally diverted water to maintain their business—local farmers, however, were strictly prohibited from rice irrigation (Traisawasdichai, 1995). Developers insist that, at the very least, displaced residents are compensated. In 1991, golf course construction in Indonesia displaced a small village of 287 peasants, who were paid one and a half cents for every square meter of property (Chatterjee, 1993). Compensation, certainly—but, with their livelihoods lost, many displaced agricultural workers have found creating new lives a difficult task.

Throughout Asia, residents affected by continued golf course development are voicing their displeasure. In addition to organized opposition groups, some residents are refusing to leave their lands: A village leader in Indonesia, for example, was imprisoned seven months for resisting eviction from his family farm (*The Economist*, 1994). Concern over water supply even led 400 Singapore residents, usually a quiet bunch, to gather at a government meeting and vocally oppose continued golf course

development on their small island city-state (Hoong, 2000). Not all public outrage has been so orderly, however. Even in authoritarian states like Vietnam, where residents often have few options for legal action, opposition to golf course construction has turned violent. In response to government appropriation of their rice fields for golf course development, 200 farmers clashed with riot police in 1996 in Kim No village, outside of Hanoi. The protestors threw rocks at construction workers and smashed vehicles with hoes and sickles; police were left to control the group with tear gas and cattle prods (Tuan, 1996).

If the experience of Hong Kong is any indication, local residents in China may have just as little input into golf course construction as others in Asia. Hong Kong residents are often left without information on the environmental implications of golf courses. Although the government has laid out provisions for environmental impact assessments of course construction, the results are not open to the public. Moreover, local communities are almost completely excluded from the decisions. Asked to talk with local anti-golf advocates, one Hong Kong official scoffed at the idea, declaring, "I don't deal with crackpots" (Chatterjee, 1993, p.2).

### *The Golf Industry Takes a Mulligan*

For an industry whose livelihood is dependent on lush green courses—and the heavy water and pesticide use needed to make them so—golf developers and associations in industrialized countries have been unusually responsive to concerns. In the United States and the European Union, golf associations have embarked on initiatives aimed at solving environmental and health problems in course construction. In the late 1990s, the United States Golf Association (USGA) enlisted government agencies, private companies, and nongovernmental organizations (NGOs) to author a list of environmental principles for golf course developers and managers.[6]

This unique cooperation of environmental interests and golf industry groups produced a document that covered issues as diverse as course planning, construction, and maintenance. The "guiding principles" attempted to address the very problems that have put a dark mark on the industry in Asia: developers are encouraged to work closely with local community groups, avoid environmentally sensitive sites like wetlands, and work to restore degraded sites like landfills, mines, and quarries. Designers are called on to retain native vegetation, reduce the introduction of new species and employ water reuse strategies. Managers are reminded about the danger of heavy pesticide use and the advantages of alternative means of pest control (PSR, 1996). In the European Union, the European Golf Association's Ecology Unit led a similar charge, producing a detailed *Committed to Green* handbook. The handbook is a how-to guide for golf course managers who are interested in creating an environmental management plan, which deals with issues like nature conservation, water resources management, and public relations.[7]

Though admirable, these programs have no power to directly affect change, for they are simply guides and purely voluntary in nature. If courses continually follow the principles laid out in the *Committed to Green* handbook, they are given a "Commited to Green" award by the golf association. The EU's program was modeled after the U.S. programs administered by Audubon International and the National Fish and Wildlife Foundation, which give recognition to golf courses that reduce water and pesticide use (Roach, 2001). Some fear that this system of recognition will result in "greenwashing." One course in Florida that received "signature status" by the Audubon program was revealed to use chemical pesticides, herbicides, and fertilizers that contained some 500 pounds of active ingredients (Chamberlian, 1995). Asian golf opposition groups like GAGM are skeptical that any golf course can be truly green. They insist that no course deserves recognition, because an environmentally friendly course is an impossibility (Roach, 2001).

To the limited extent that it can affect change, the golf industry appears to have committed itself to solving the problems that threaten the game. Protracted conflicts with local communities are bad for the game's image. Similarly, unsustainable environments threaten the game's overall health. There is also a certain amount of responsibility felt by those who hold the game in high regard. One on-line golf newsletter took great efforts to remind its readers of the honor of the sport. "[Golf] is a game of tradition and honor…it is the honorable thing for us to share what we have learned about stewardship and sustainability to emerging golf cultures. Let's accept the challenge to transfer the newest thinking and best models to the emerging Asian Pacific economies and their golf courses" (Horton, 2002, p.3).

### *Straight Up the Middle: Prospects for an Improved Industry*

Indeed, the future of golf in Asia lies in China—the country boasts not just the region's largest population but also its largest landmass. The Asian Professional Golf Association reports, "with [China's] size, population and potential [golf course] sites, China is experiencing her

first ever golf boom, a boom that will continue for some time" (APGA, 2003, p.2). While China is primed to reap the benefits of the industry's entrance into its market, the country is also very susceptible to the problems that have plagued the game in other Asian countries. Of great environmental concern, in particular, is the expected golf construction in northern China. The north, already facing severe water shortages, will certainly struggle with the stress put upon its water supply by golf courses—widespread construction, with its disruption of soil and natural vegetation, will also intensify the north's growing problem of desertification. Moreover, Dr. Mike Kenna, research director of the USGA's Green Section, suggests that the colder weather in China's north will pose an additional set of problems for turf management—the lower water-consuming grasses are intended only for warm climates.[8] The more hearty variety required for cooler climates will require significantly more watering.

**Short of creating a land of artifical courses that require no pesticides and demand no water, the ecological environment in China will be strained by continued golf course construction**

Despite past negative experiences in other parts of the Asian Pacific region, China can benefit from its late start by reinventing the way in which the golf industry makes its mark in Asia, learning from the mistakes and missteps of other countries. What are the prospects for an environmentally friendly and conflict-free Chinese golf industry? There are certainly reasons to be hopeful in China if NGOs, the government, and developers prioritize safe golf course development.

### *NGOs*

Though Chinese environmental NGOs are not free to serve the often-antagonistic role of groups like Global Anti-Golf Movement, there are signs that they are beginning to engage the golf industry in their own unique way:

- Upon hearing news of plans for a large golf and recreational project in a wetland outside of Beijing, in the summer of 2002 an activist from the Beijing-based NGO Green-web and a local environmental journalist did their own investigation and wrote a letter of concern to the municipal government. Green-web also enlisted the assistance of Friends of Nature, China's largest legally operating NGO, and the proposed golf course construction was the topic of discussion at a recent Green Journalists Salon in Beijing. In the end, these NGO and news media groups successfully persuaded the local government to cancel its plans (Siu, 2002).
- In Nanjing, another grassroots organization, Green Ant, has launched a program opposing proposed golf developments near Zijin Mountain.
- In the spring of 2002, a journalist in Shanghai wrote an internal memo about possible environmental and health dangers of planned golf course construction near the city, which led officials to postpone development and conduct studies to revise the plan.[9]

While these initiatives appear small, if Chinese NGOs and environmental journalists sustain interest and involvement from the beginning of the golf industry's growth they help to protect the environment, serve as an outlet for local residents to express their concerns to policymakers and developers, and bring greater transparency to the approval and development of golf courses.

### *Responsible Developers*

Chinese and Asian golf associations have a great deal of information with which to create their own list of principles. Dr. Kenna of USGA suggests that Chinese golf developers and managers visit the United States to see how sustainable courses can have low environmental impact while maintaining a green look. The APGA could follow USGA's lead and engage NGOs to devise their own list of principles by which Chinese courses can create eco-friendly courses. There are limitations, however. Professional associations can only offer voluntary guides, while NGOs in China are primarily limited to education activities. Governmental intervention in Asia has proved more useful in assuring sustainable ecology. In Japan for instance, increased governmental guidelines on chemical use have improved ecological health near some golf courses (Hesse, 2003).

### *Environmental Authoritarianism*

The future of China's environment may very well lie in the hands of the central government. If China's government exercises "environmental authoritarianism," ecological and health concerns of golf course construction

could be mitigated. When resolved to solve a problem, the strong hand of Beijing can indeed be useful. While, the government has not always used its sweeping power to benefit China's environment, the 2008 Olympics offer a glimpse at the government's power to affect environmental change. Though the results are not yet known, Beijing has devoted great resources to the environment, putting $12.2 billion towards efforts to green the city.

In the example of golf, heavy-handed government regulators have indicated a willingness to place environmental and social concerns above economic ones. After a visit in the mid-1990s, Dr. Kenna commented "the Chinese are painfully slow at approving each phase of [golf course] construction…[often] due to environmental concerns [and] displacement of farms and people."[10] While "painfully slow" is certainly not in the interest of developers, it might very well benefit those concerned with environment and social equality issues. One recent example of a cautious local government occurred in Shanghai where the Environmental Protection Bureau now mandates that all courses treat runoff and limit herbicide use; meanwhile the municipal government has placed a moratorium on further golf course construction in Shanghai (Xinhua, 2002).

Whether the sustainability of golf courses will ever be a priority throughout China is unknown. Certainly, economic opportunities presented by the golf industry will compete strongly with environmental interests. Despite the concerns of social unease and environmental inequality, construction will likely stay centered in areas that offer cheap land usually populated by poor residents. Short of creating a land of artificial courses that require no pesticides and demand no water,[11] the ecological environment in China will be strained by continued golf course construction. Yet, provided local NGOs, communities, the government, and even industry officials maintain an active dialogue and keep ecological and social concerns on the front burner, it is at least possible that golf and environment could coexist with limited detriment to either.

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## Endnotes

[1] With the region's longest history of golf, most of Asia's golfers hail from Japan. Among Japan's 127 million people, 17 million (13 percent of total population) are counted as golfers; the United States, for the sake of comparison, claims just eight percent of its population as aficionados of the sport.

[2] Report available online: http://www.oag.state.ny.us/environment/golf95.html

[3] For a review of pesticide regulation challenges in China see Hamburger, 2002.

[4] GAGM (http://utenti.tripod.it/dossierisarenas/manifest.htm) was founded in 1993 and serves as an umbrella organization for groups opposed to golf course development—the organization does little work beyond issue condemnations and criticisms. APPEN, on other hand, has broader environmental goals, one of which is opposing golf course construction. Interestingly, both groups are affiliated with Friends of Earth Malaysia, perhaps the most respected environment NGO in the country.

[5] Asian Human Rights Commission, "Asian Human Rights Charter." [On-line]. Available: http://www.ahrchk.net/charter/mainfile.php/eng_charter/54/

[6] Among the NGOs participating were the Sierra Club, Friends of the Earth, Audubon International and the National Wildlife Federation.

[7] "The Committed to Green Handbook for Golf Courses" handbook is available on-line: http://www.golfecology.com/comtogrn/comeng.htm

[8] Personal interview, 11 April 2003

[9] For full details see commentary written by Wu Fengshi (2002).

[10] Personal Interview, 11 April 2003.

[11] While the golfing public will likely reject the concept, the technology for artificial courses does exist. Jonathan Dee (April 20, 2003) reported in *The New York Times Magazine* that FieldTurf recently completed its first nine-hold course made entirely of artificial grass.

# The Zhangjiajie Phenomenon and Solutions for Preserving the Nature in Nature Reserves

*By Huang Liangbin (translated by Qin Xin)*

In the mountainous region of western Hunan province is the world-famous scenic site of Wulingyuan in the city of Zhangjiajie. In 1982 when the State Council designated Wulingyuan China's first National Forest Park, this 369 square-kilometer reserve was a near pristine area with sandstone pillars and canyons, lofty trees, tranquil lakes, and crystal clear rivers. In 1992, the area was internationally recognized when UNESCO placed it on the World Heritage List.

Six years later, however, the Chinese government received serious criticism from UNESCO for rapid urbanization, massive development of tourism, and the growing pollution in Wulingyuan. In a report issued in 1998, UNESCO pointed out that excessive tourist facilities greatly damage the natural beauty of the area and that the Chinese government has failed to fulfill its commitment to protect this natural heritage site. UNESCO also warned it would have to consider removing Wulingyuan from the World Heritage List if urbanization and commercialization of the park was not brought into immediate and effective control.

The unchecked growth that is occurring in Zhangjiajie/Wulingyuan—often referred to in China as the Zhangjiajie phenomenon—is typical of the development of many Chinese natural reserves and reveals the conflicts between short-term commercial interest and the long-term interest of preservation. This article will take a closer look at this issue and offer several measures that could lead to its solution.

### *Zhangjiajie: Excessive Development of Tourism*

Once the hidden beauty of Wulingyuan became known to the outside world in the early 1980s, the area immediately turned into an attractive spot for both domestic and foreign tourists. Wulingyuan has received over 20 million visitors since its "discovery." In 2000 alone, more than five million people visited the park, spending 1.95 billion RMB. In 2001, tourism income exceeded two billion RMB. The once remote villages surrounding Wulingyuan have turned into prosperous cities and two new towns have even sprung up at the center of the park.

These developments have undoubtedly promoted the growth of the local economy. But a high price is being paid: the natural environment has been seriously damaged by the massive construction of tourism facilities. Recent years saw the construction of five new tourist roads, two cable car lines, and over 40 restaurants and hotels. The newest addition to Wulingyuan Park is a 300-meter high glass elevator meant to whisk tourists quickly to breathtaking views at the top of a mountain. In Luoguta, one of the core scenic spots in the park, there are more than ten hotels and restaurants of considerable size. Notably, the first guesthouse in Luoguta was built by the Forestry Administrative Office of Zhangjiajie, and the other hotels are all properties of various powerful departments of the local government and state-owned enterprises.

The urbanization, commercialization, and many instances of "artificialization" in the park have become the target of criticism by scholars, scientists, and even some tourists. Professor Xie Ninggao of the World Heritage Center at Beijing University said in indignation, "I'd see something new every time I went to visit Zhangjiajie: cable cars at first, then came the glass sightseeing elevator." Professors Wang Jiaji and Li Jingrong at the Chinese Environment Academy also pointed out that the excessive construction of tourism and entertainment facilities in Zhangjiajie has caused forest fragmentation, interfered with the normal species flow, and reduced the habitat of plant and animal species.

In the wake of the "Zhangjiajie phenomenon," one cannot help but ask the question why Wulingyuan's listing as a World Heritage site has not contributed to better protection of this natural wonder. Four factors—weak law enforcement, poor management, exploding commercialism and an unhealthy tourist culture—are responsible for this phenomenon of unrestrained exploitation and irrevocable damage in Wulingyuan.

### *Weak Awareness and Enforcement of Law*

China does not lack laws and regulations on environment and resource protection. Indeed, environmental laws are actually the most complete in China's legal system. With regard to Zhangjiajie, the Hunan provincial government also has drawn up a special regulation for its protection and preservation. One anecdote illustrates that strict laws on limiting construction in Wulingyuan do exist: In November 2001, when I tried to bring the attention of the mayor of Zhangjiajie to the shortage of public

restrooms he replied that the municipal government had no power to remove even a single tree or blade of grass in the national park—the construction of a restroom has to be approved by the provincial government and legislature.

However, in China's unique political context, enforcing laws is a completely different story from making laws. Moreover, it is not unusual for those who violate laws to go unpunished. The so-called "strict law implementation and enforcement" often only applies to people on the street, not to those in government institutions or wealthy, influential enterprises. This explains why the hotels and restaurants in Luoguta all belong to the most powerful provincial and local government departments. For instance, the Hunan Electricity Bureau, with its immense profit from a monopoly in electricity supply, has not only built several hotels in Zhangjiajie, but also in Mount Hengshan, another famous tourist site in Hunan. Officials in local governments often find themselves powerless when dealing with more senior bureaucracies. One official responsible for clearing out illegal constructions in Wulingyuan Park complained to me:

> [Development in] Luoguta is the primary source of pollution in the Jinbianxi River. Ten years ago this river was crystal clear and you could see fish and shrimp, even giant salamanders. But now, we have to build a water treatment plant! Owners of the illegal constructions are all organizations of power. It is simply impossible for us to do our job.

*Unrestrained Commercialism*

The free-market reforms and Open Door policy begun in the late 1970s has transformed China from a society centered on politics to one centered on the economy. It is certainly progress that Chinese citizens are no longer fervent about class struggle, but today's public is fraught with political apathy and a worrisome tendency towards commercialism. Eager to get out poverty, most Chinese are racking their brains to find ways of making money. Preserving natural and cultural heritage is not even an issue in such a mentality. This intense drive to make money leads people to exploit natural resources—in effect, "draining the pond to fish," a practice clearly counter to the principle of sustainable development.

An irrational, unchecked pursuit for economic development has caused the Zhangjiajie tragedy. In less than 20 years it has evolved from a "hidden beauty" to a world-famous tourist site, receiving over five million visitors annually by 2000. The right strategy at this time would have been to restrict the number of tourists into the park for the sake of sustainable development; however, this contradicts local government plans for the park. In 2001, the Zhangjiajie municipal government released a document entitled *Decision on Speeding up the Development of Tourism*, which set the target of receiving eight million visitors each year by 2005, including 400,000 from overseas, hoping to increase tourism income by 20 percent each year.

*Cableway at the Tianzi Mountain*

What is more alarming is that officials of the Zhangjiajie government quoted "specialists" as saying that Zhangjiajie's ecological condition could sustain 20 million tourists each year! It is a public secret that you can obtain any type of environmental evaluation report as long as you pay the evaluators well—many Chinese scientists clearly have lost their social conscience in this wave of commercialism. Under such circumstances, it is no wonder that even after Zhangjiajie received serious warning from UNESCO and Premier Zhu Rongji ordered a large-scale demolition of illegal construction in Wulingyuan, the most controversial tourist elevator project was still able to move forward.

So here is the paradox: while local officials claim they do not even have the power to build a restroom, commercial facilities are built one after another. Ultimately only one factor determines whether a project gets a green or red light: the potential profitability.

The commercialization of the park has not only caused serious environmental and ecological damages, but also subjected it—a public resource—to exploitation by private businesses. In the initial period of construction on public lands, local governments usually offer long leases at an extremely low price to bring in the necessary investment. For instance, the cable and elevator services constructed in Wulingyuan are so profitable it would take

only two to three years for the contractor to get the full investment back. However, the lease granted to investors for these tourist facilities was 50 years or even longer.

While private and state-owned companies can earn almost unlimited profit from what should be public property, local residents have not really benefited from these projects. Farmers do not have much land in this mountainous area, and farming is their only livelihood.

During one of my visits to Zhangjiajie in the fall of 2001, I saw farmers digging sand in a waterless riverbed with very primitive tools and even bare hands in order to make a modest living. Just two kilometers away were tourists singing, dancing, drinking, and dining in the luxurious hotels, restaurants, and nightclubs. Such a contrast was shocking and sickening. The situation with the local government is by no means better. In 2000, the city of Zhangjiajie recorded a budget deficit of over 200 million RMB. The total fiscal income for the district of Wulingyuan was only 50 million RMB in the same year, while the income of private cable service contractor in Wulingyuan Park, which is within the jurisdiction of the district, was more than 50 million RMB.

*Lack of Effective Management*

Many famous scenic tourist sites in China, including Zhangjiajie, suffer from poor management caused by overlapping and competing government jurisdictions. There are 1,268 state-level cultural heritage sites, 119 state-level scenic sites, and hundreds of natural reserves and forest parks. Among them are China's 28 World Heritage sites. However, these different categories of sites fall under the administration of many different government organizations, Roughly speaking, the Ministry of Construction watches over state-level scenic sites, the National Forestry Administration oversees forestry parks, the Department of Natural Resources is responsible for geological parks, the State Environmental Protection Administration takes care of state-level natural reserves, and the State Tourism Administration administers famous tourist sites. In addition to this upper level management, all these sites are subject to administration and management by local governments.

It is not difficult to imagine, therefore, that a World Heritage site like Zhangjiajie finds itself under the administration of a myriad of government bureaucracies that exercise their power with different approaches and goals. Consequently, there is much confusion and inefficiency in the management of the park. To make things worse, China's legal system does not have a strong binding effect on government administrative bodies. Hence, these administrative bodies enjoy an almost unrestricted freedom in approving construction of new tourism facilities.

**While local officials claim they do not even have the power to build a restroom, commercial facilities are built one after another.**

*Weak Environmental Consciousness and An Unhealthy Tourist Culture*

So many new facilities are constructed in Zhangjiajie and in many other scenic tourist sites in China because Chinese tourists demand and appreciate these facilities and services. In China, travel, still a privilege for those economically well-to-do, is often associated with luxury and comfort. Whether their destination is a big city, a seaside resort, or a ski camp, Chinese tourists very often expect the same convenient transportation, gourmet dining, and deluxe hotels. China's tourist culture is very different from that in developed countries. Many Chinese people are unable to truly appreciate the wilderness: the purpose of travel is to "see" the wonderful sceneries, not to "experience" the nature and be close to the nature through hiking, mountain climbing, or camping. Therefore, it is no wonder that some Chinese tourists visit the Wulingyuan Park in high heels and miniskirts and some look for discothèque and karaoke bars to spend the night.

Not only are ordinary tourists not conscious of the environmental implications of their behavior, the mass media, which supposedly have the responsibility of raising the environmental consciousness of the public, are also influenced by this unhealthy tourist culture. While Mr. Moukala of UNESCO's China Representative Office finds news stories like "the Summer Palace in Beijing received over 300,000 tourist in a single day" disturbing, the Chinese news media reported these numbers as a significant achievement of China's tourism industry. When the construction of the 300-metre high glass elevator in Wulingyuan Park was criticized by some scholars and specialists, an influential evening newspaper in south China applauded it as "such a wonder that it reminds us of the legendary hanging gardens of Babylon."

***Looking for a Solution***

Excessive development and exploitation has caused severe damage to the natural environment in Zhangjiajie. Without proper protection, it can be expected that this natural heritage for all humankind will become another victim of commercialization and urbanization. China is confronted with a daunting challenge in the protection of Wulingyuan and many other parks, natural reserves, and cultural heritage sites. Several key steps are needed to remedy this tragic situation:

• *Increase the role of news media and government in raising environmental awareness*. The news media should make efforts to raise environmental consciousness and publicize the principle of sustainable development to all citizens in general, and the leadership of various government agencies in particular. Since the executive branch in China's government system is still the most powerful it is crucial for these leaders to understand the importance of environmental protection and make environment-friendly policies.

• *Strengthen implementation and enforcement of law*. China has already put in place a relatively complete legal system in environmental protection and natural resource exploration. The task now is how to enforce these laws effectively and strictly.

• *Take effective measures immediately to preserve the original feature of the parks and natural reserves*. Any development of tourism in these areas should follow the principle of sustainable development.

• *Separate and clearly delineate management and administration authority over national parks and reserves*. A transparent "licensed management system" should be put in place to make responsible government agencies more accountable.

•*Limit the number of tourists received by each park*. At the same time, each park should be closed to tourists regularly to let it recover from the external impacts on its environment and ecological system.

If all the measures above can be materialized, I believe, we can remain hopeful that the "Zhangjiajie phenomenon" in China's natural reserves can be curtailed and even solved.

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# Why Industry's Environmental Performance Doesn't Count

*By Joakim Nordqvist and Gabriel Somesfalean*

To fuel China's breakneck economic development over the past two decades, the government has needed to explore different options for increasing efficient use of the country's resources. Consequently, for more than twenty years, energy efficiency in industry has been a priority in central policy and planning, and actual improvements in this area have helped boost China's remarkable economic growth. Being an issue of vital national interest, virtually no industrial manager or owner in China is unaware of the importance to conserve energy. Thus, admitting concern for the energy performance of an enterprise will not cause any manager to lose face. Environmental performance criteria, such as emission control, however, are viewed as a more sensitive topic. We argue that contrary to common views within China's industrial sector, environmental performance criteria are not necessarily stumbling blocks hindering progress and development. They may instead be perceived as stepping stones to more cost efficient and sustainable production.

In July 2002 we set out to conduct a study of the highly polluting cement industrial sector—which includes not simply the factories, but the government agencies and other institutions linked to cement producers. One of our objectives was to investigate the room for policies that would stimulate acceptance and prioritization of pollution control and other environmental performance measures. To understand the potential openness for such policies we explored how Chinese officials and industrial managers perceive the relationship between environmental performance and energy performance. In other words, to what extent would industry and authorities in China accept or use measures enhancing energy efficiency if they also (or mainly) addressed environmental concerns?

### *Mismatch Between Needs and Ambitions*

The main aspects of environmental performance that we approached in our study were: (1) routines and methods for pollution emission monitoring, (2) data collection, and (3) information management. In a newly established partnership, our research center—the Lund Institute of Technology—cooperates with the Harbin Institute of Technology (HIT) in China on a project to develop and market inexpensive and versatile monitoring of gaseous emissions, using small, portable equipment. Our partners at HIT are enthusiastic about the prospects for future applications of this technology within China. Strikingly, among the envisioned industry users of the new monitoring equipment, this optimism is not reciprocated.

The lack of reliable information about actual emission performance in Chinese industries is indeed a serious barrier to discussion about measures to address these problems. Many enterprises, it seems, would prefer this barrier remain in place. "We comply with emission standards" is the routine answer from cement enterprise managers to questions about, for example, sulfur dioxide, but details on emissions are generally not available. Types of pollution without government emission standards are, by definition, not a concern. Consequently, our queries on carbon dioxide and climate change were promptly dismissed. Unlike energy efficiency, continuous improvements of environmental performance are not seen as a common national cause or a corporate duty. More to the point, under China's current regulatory framework no effective economic incentives (neither carrots nor sticks) exist to spur incremental achievements in environmental protection.

Our study was by no means exhaustive, but it captured some general traits of the Chinese cement sector. During five weeks in China, we visited government agencies, research centers, and cement factories in Beijing, Tianjin, Heilongjiang, Liaoning, and Sichuan. Chinese cement production presents an interesting case study not only due to the great potential for improvements in energy efficiency and environmental performance, but also because there exists a strong ambition among national authorities, such as the former State Economic and Trade Commission (SETC), to restructure the sector.[1] Central authorities have targeted excessive dust emissions, poor resource efficiency, deficient product quality, and a plethora of technically and financially weak, small-scale producers as problem areas in need of change. Hence, all sector representatives claim to be actively working on these weaknesses. We, however, wanted to gauge the sector's receptiveness to two other problem areas—acid precipitation and climate change. Both of these environmental problems are linked to many criteria used to evaluate industrial performance. While China's cement producers do not prioritize the control of emissions that generate acid precipitation and contribute to global warming, regulating such pollution is high on the agenda of some Chinese central policymakers and international cement industries.

*Acid Precipitation*

Serious damage from acid precipitation already afflicts large parts of China, and therefore measures to reduce emissions of sulfur dioxide ($SO_2$) receive priority, at least with central authorities. For example, in the late 1990s the central government created regulations to enforce a national system of Total Emission Control for $SO_2$, and established special "control zones." The main source of these emissions is the power sector, which naturally receives the lion's share of attention from researchers and regulating authorities.[2] In cement production, however, $SO_2$ is much less of a problem. Due to the alkaline properties of the raw material (limestone), the sulfur contained in the process fuel is captured chemically within the produced cement rather than released into the flue gas. Even when using high-sulfur coal as fuel, the emissions of sulfur dioxide from a cement kiln may be negligible. Therefore, cement industries have not internalized China's campaign against acid precipitation onto their own agenda. Our hypothesis that cement producers in China would be supportive of mechanisms to help them collect and verify information about their performance in controlling $SO_2$ emissions was naïve and wrong.

*Climate Change*

Many of the world's most important cement producers recognize global warming as a major concern for their industry. In a joint effort called the *Cement Sustainability Initiative*, ten transnational cement corporations singled out climate change and the reduction of carbon dioxide emissions as one of the industry's most important challenges for the future.[3] China's cement sector actors, however, overlook climate change completely. Still, at the level of international climate change politics, China participates actively as a signatory party within the United Nations Framework Convention on Climate Change. And, at the UN's World Summit on Sustainable Development in Johannesburg in 2002, Chinese Premier Zhu Rongji announced China's ratification of the Kyoto Protocol.[4] This announcement constitutes an important signal, not least domestically, of the leadership's acknowledgement of the issue. Despite these activities, commitment and information on climate change do not trickle down from the central political level to lower-level authorities and industries.

Where international cement producers see economic as well as public relations opportunities in giving attention to climate change, Chinese enterprises perceive threats. This is so, even when some greenhouse gas control measures could generate benefits in areas China's cement industries prioritize, such as resource and energy efficiency. An illustration of this is the Clean Development Mechanism (CDM, a mechanism under the Kyoto Protocol[5]), the prospect of which tends to be categorically rejected by Chinese cement industry managers and owners, researchers, and staff at environmental protection bureaus. Even though potential international partners are cautiously interested in the possibility of future cement-related CDM projects in China, domestic skepticism towards CDM remains. As in the case of sulfur dioxide, our hopes were soon dashed of finding even the slightest recognition within the Chinese cement sector of the benefits of controlling emissions. Nonetheless, we have gained valuable insights into how and why China's cement industry lacks environmental stewardship and how it might be strengthened.

***Roots of the Problem***

Product quality improvements, energy and resource efficiency, and technology upgrading are cornerstones in current central and local efforts to reform and restructure Chinese cement production. From our point of view, all of these reform objectives contain obvious connections to improved environmental performance, which is, in comparison, a low- (or sometimes even non-) priority issue for the cement industry. In our study we wanted to explore the possibilities for central and local policymakers in China to encourage environmental performance improvements through linking such measures to existing and recognized priorities. However, when environmental protection enters the picture, cement sector stakeholders—including policymakers—often seem to shun the concept of "synergies" or "co-benefits." We have identified some of the possible reasons for such attitudes:

- Technology for emissions monitoring is needed but generally not wanted for fear—justified or not—of evidence of bad performance, which may pose legal implications and, certainly, loss of face. This reluctance is found among enterprise managers, as well as local environmental protection authorities.
- In China, government agencies, businesses, and even the general public have little or no appreciation of the additional value to enterprises accrued through taking corporate responsibility to exceed legal requirements for pollution emissions.
- Prevailing conservatism in industry management tends to hinder analytic approaches and susceptibility to new ideas on how to run an enterprise. The endeavor to seek truth from facts (*shishi qiushi*) is often compromised in the pursuit of approval by the local

leadership.

• An underlying problem, and a characteristic component of the first as well as the third points above, is protectionism of industry. This is particularly strong at the local level, where governments and enterprises have complex and tight connections to each other.

In light of these attitudes one can understand why climate change is a non-issue within cement and other industrial sectors in China. Another important reason for this dismissive attitude is that the level of awareness about climate change as a global issue is quite poor within China's cement sector—including enterprise managers, owners, research institutes, and local and even central authorities. Attention to climate change and other environmental protection issues is often avoided, fearing the costs rather than appreciating the potential benefits—not a very surprising stance by Chinese cement companies, perhaps, but notably quite different from the path adopted by leading international cement corporations. The sector also overlooks the possible advantages of corporate environmental stewardship in the matter of acid precipitation, where high performance would result in an improved public image and new favorable government policies.

In many countries, stakeholder participation, including nongovernmental organizations (NGOs), local residents, and the general public, is seen as an important component when promoting environmental considerations in business decisions. Effective stakeholder participation, however, depends on the existence of a generous measure of corporate transparency. In China, government agencies and industry are not only interconnected, but also highly hierarchical. Thus, flows of information and data are generally segregated into different sets of vertical channels for people at various levels. Any piece of information may therefore be disclosed only to, and used exclusively by, persons with proper authority or sufficiently high-ranking contacts. Consequently, hierarchical opaqueness and political influence over management hampers stakeholder participation efforts in Chinese industries.

In all it seems that current fears and conservatism offer little room for progressive initiatives in the environmental field to arise within the cement sector. Nevertheless, this stagnant industrial sector could be vitalized with some new policies.

### *Routes Past the Problem*

We believe that a holistic view on the challenges ahead is necessary in order for the cement sector to develop sustainably as it transforms. Impulses from international partners and competitors may possibly form seeds of inspiration, but the effort and the responsibility to promote better environmental performance within the cement sector ultimately rests with domestic actors. Understanding how to spark momentum to alter priorities in this industrial sector is challenging. Clearly, to successfully generate a deliberate push for corporate environmental stewardship would require many changes within the local industrial and political spheres.

**When environmental protection enters the picture, cement sector stakeholders—including policymakers—often seem to shun the concept of "synergies" or "co-benefits."**

The present economic and political frameworks provide disincentives rather than encouragement for initiatives that incorporate emissions performance, but through further analyses we hope to identify policies and measures that could promote greater concern for environmental concerns. Introducing attention to environmental performance in considerations for career promotion both in industry and regulatory authorities would, for example, constitute an important change. It is necessary to develop many such economic and other types of incentives that reward the adoption of environmental responsibility by the industrial sector.

Initiatives to increase stakeholder participation have been made in China, not least by foreign-owned companies and international NGOs. One example involves the cement producer Lafarge and WWF, who cooperate with local Chinese authorities in an effort to help conserve a nature reserve which is also a habitat for giant pandas. If alternative views on business management can gain ground in China, such experiences may inspire and spread among domestic enterprises as well, and be applied to other areas of environmental concern.

Energy efficiency has long been a recognized objective in China. Environmental concerns, however, are not yet well received, not even in combination with measures to enhance energy efficiency. Internalizing new priorities in industry is difficult, for sure, but possible. For example,

in recent years the Chinese central government's push to restructure the cement sector led to the emergence of product quality as an important performance indicator in cement production. Attention to synergies, we believe, is a crucial component in the design of successful policies to promote the acceptance of new environmental priorities within China's cement, and other industrial sectors.

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[1] Since our visit, winds of change have altered the casting of sector actors. In accordance with decisions made in the first session of the tenth National People's Congress in March 2003, SETC has been dissolved and its responsibilities have been split and transferred to new or restructured authorities such as the Ministry of Commerce, the State Asset Management Commission (SAMC), and the National Development and Reform Commission.

[2] Information on $SO_2$ management initiatives in China can be obtained through the NGO Environmental Defence: www.environmentaldefence.org. Publications on the topic include Ma Zhong and Daniel Dudek (Eds.). (1999). *Total emission control and emissions trading.* (In Chinese). Beijing: China Environmental Studies Publishing House, and A. Denny Ellerman. (2002). "Designing a tradable permit system to control $SO_2$ emissions in China: Principles and practise." *The Energy Journal*, vol. 23, issue 2.

[3] More information on the Cement Sustainability Initiative is available on a Web site hosted by the World Business Council for Sustainable Development: www.wbcsdcement.org. See also Joakim Nordqvist, Christopher Boyd, and Howard Klee. (2002). "Three big C's: Climate, cement, and China." *Greener Management International*, issue 39.

[4] In terms of greenhouse gas emission reductions, China, which is a country heavily dependent on fossil coal as a primary energy source, has implemented national policies that have successfully decreased energy intensity. In essence, substantial amounts of carbon dioxide have been mitigated, although not specifically out of concern for climate change. Domestically, climate aspects receive very little publicity and acknowledgement, even though Chinese experts and scientists contribute constructively in international climate change forums such as the Intergovernmental Panel on Climate Change.

[5] The CDM is one of the three flexible mechanisms specified by the Kyoto Protocol. It allows for the generation of Certified Emission Reductions (CERs) when a project, undertaken in a developing country, results in reductions of greenhouse gas emissions compared with a baseline scenario, which does not include the project. After being issued, the CERs may be traded and used in countries that need them to stay in compliance with their commitments to limit emissions.

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