

**The Case of China and the Global Environment<sup>1</sup>**  
**Dizzying Growth, Devolution of Power, Environmental Disaster**  
*(Draft Not for Citation)*

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**Introduction**

The rise of China as an economic power is one of the great stories of the latter half of the 20<sup>th</sup> century. Twenty-five years of reform have produced staggering results: hundreds of millions of Chinese have been lifted out of poverty, China's economy continues to grow at a rate of 8-12% annually, and the country currently ranks as the fourth largest economy and third largest exporting nation in the world, after the United States and Germany.

At the same time, this growth has occurred without much consideration for the country's environment. Building upon centuries of environmental degradation and pollution, the very rapid industrialization of the last quarter century has contributed to some of the highest rates of air and water pollution in the world, severe land degradation, and a range of emerging resource challenges.

For the rest of the world, China's environmental practices are increasingly setting off alarm bells. China is now one of the largest contributors to virtually every global environmental challenge: climate change, the illegal timber trade, and marine pollution among them. Moreover, even as the world marvels at China's dizzying growth rates, the environment is impinging on future growth, harming the health of the Chinese people, and contributing to serious social unrest, all of which threaten to send China's growth trajectory off track.

There are some signs of hope. China's leaders have significantly ramped up the attention they are devoting to the environment, and levels of investment in environmental protection have increased steadily. Beijing has also begun to experiment with new policy approaches designed to take advantage of its evolution toward a market economy and its growing integration with the world economy.

To date, however, China's leaders have been unable or unwilling to take the necessary political and economic steps to reverse the overall negative trends they are confronting in environmental degradation and pollution. China's economic, social and political welfare—and to a large extent that of the world—over the next decade will all

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be shaped by how effectively the country's leaders and the people integrate environmental protection with economic development.

For the United States, the environmental challenge China presents is a politically complicated one. Over all, both American and Chinese leaders consistently stress the environment an arena of potential fruitful collaboration between China and the United States, and enthusiasm generally abounds—at least rhetorically—for identifying new cooperative ventures.

At times, however, the political temperature in Washington rises, and the environment becomes a source of contention in the dialogue about China. Serious concerns over China's contribution to transboundary air pollution, which carries mercury and other contaminants to U.S. land, as well as China's significant contribution to global climate change top the list of U.S. policymakers' concerns.

Yet Washington's real response to this challenge remains limited. The United States, itself, is a leading contributor to climate change and a laggard in its response. Moreover, financial constraints limit the ability of U.S. government agencies to move aggressively in cooperative ventures. Thus real cooperation has been limited in scope. Nonetheless, the private sector—multinationals and international non-governmental organizations—pursues a wide range of collaborative efforts, and the U.S. government, as a whole, continues to place the environment on the positive side of the ledger in the bilateral relationship.

### **An Environmental Snapshot**

On the domestic front, China faces the full range of environmental challenges: air pollution, land degradation, and water quality and availability. The air in over half of China's cities is polluted,<sup>2</sup> and 100 million people are exposed to very serious pollution.<sup>3</sup> According to Vice-Minister of China's State Environmental Protection Administration (SEPA) Pan Yue, five of the world's ten most polluted cities are in China.<sup>4</sup> Acid rain affects one-quarter of China's land and one-third of its agricultural land, diminishing agricultural output, eroding buildings, and contributing to respiratory problems. Regional haze results in 70% of crops yielding anywhere from 5-30% less than their potential.<sup>5</sup> Indeed, despite the upcoming Olympic Games, it remains unclear whether or not Beijing will be able to reach its air quality targets for 2006.<sup>6</sup>

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<sup>2</sup> "China Reports Cities Suffering from Severe Air Pollution," People's Daily Online (September 6, 2006).

<sup>3</sup> Jonathon Watts, "A Growth Stream, or a Way to Get Filthy Rich?," The Guardian (November 6, 2006).

<sup>4</sup> Pan Yue interview with Der Spiegel (March 2005).

<sup>5</sup> W.L. Chameides, H. Yu, S.C. Liu, M. Bergin, X. Zhou, L. Mearns, G. wang, C.S. Kiang, R.D. Saylor, C. Luo, Y. Huang, A. Steiner, and F. Giorgi, "Case Study of the Effects of Atmosphereice Aerosols and Regional Haze on Agriculture: An Opportunity to Enhance Crop Yields in China Through Emission Controls," Proceedings of the National Academy of Sciences, Vol 96, Issue 24 (November 23, 1999).

<sup>6</sup> "Summer Rain Lifts Beijing's Hope of Reaching 'Blue Sky' Goal," Xinhua Economic News Service (November 1, 2006).

The sources of China's air quality challenge are multifold: its overwhelming reliance on coal for its energy needs, its poor energy efficiency and conservation practices, the energy demands of a growing urban population and the rapidly increasing role of automobiles in the transportation sector.<sup>7</sup>

China also suffers from serious land degradation. Deforestation, along with the overgrazing of grasslands and over-cultivation of cropland, has dramatically changed the landscape of the country. Deforestation contributes to biodiversity loss, soil erosion, and local climate change. Overall, almost 40% of China's land is affected by soil erosion.<sup>8</sup> The world's highest water erosion rates occur in China in the Loess Plateau, where 1.6 billion tons of topsoil is washed into the Yellow River on an annual basis.<sup>9</sup>

In addition, China, which is roughly the same size as the United States, is now more than one-quarter desert, and desertification is advancing at a rate of roughly 1900 sq.miles annually.<sup>10</sup> According to the State Forestry Administration, desertification affects 400 million people.<sup>11</sup>

The most serious environmental challenge China confronts, however, is ensuring access to clean water. China has 7% of the world's water resources but is home to 20% of the world's population.<sup>12</sup> The country's annual per capita water supply is 25% of the global average, and by 2030, per capita water supply is expected to fall from 2200m<sup>3</sup> to below 1700m<sup>3</sup>. Demand for water is expected to triple from 120 -400 billion tons during 1995-2030. And according to one Chinese expert, cities in the northeastern regions of the country could run out of water in five to seven years.<sup>13</sup>

Water pollution is also a significant problem. In a survey of 44 Chinese cities, officials discovered that groundwater pollution was a serious problem in 42 of them.<sup>14</sup> More than three-quarters of the water flowing through China's urban areas is considered unsuitable for drinking or fishing, and thirty percent of river water monitored by the Chinese government is worse than grade 5 (not suitable for agriculture or industry).

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<sup>7</sup> China relies on coal for approximately 70% of its energy needs, consuming some 2.1 billion tons in 2005. It is the largest consumer of coal in the world and the largest emitter of sulfur dioxide. Coal consumption is expected to double during 2000-2020. Low utilization of energy efficiency technologies in China's buildings and industries are also a problem: buildings in China consume 2-3 times the energy of those in developed countries in comparable climates. Urbanization is a third challenge. Per capita energy consumption for urban residents is 250% more than that of their rural counterparts. Finally, perhaps the greatest future challenge is in China's transportation sector. By 2050, Chinese officials estimate that China will have more cars on the road than in the United States.

<sup>8</sup> "One Third of China's Land Areas Still Suffer from Soil Erosion," China Economic Net (June 2, 2005).

<sup>9</sup> "Soil and Trouble," *Science* Vol. 304 Issue 5677, pp. 1614-1615 (June 11, 2004)

<sup>10</sup> "China: A City Built on Mao's Order Fights an Encroaching Desert," IPS News Service (November 8, 2006).

<sup>11</sup> "China Launches Unprecedented Forestry Programs,"

<http://www.China.org.cn/baodao/english/newsandreport/2002july1/12-2.htm>

<sup>12</sup> Daniel Griffiths, "Drought Worsens China Water Woes," BBC News (May 31, 2006) <http://www.news.bbc.co.uk/2/hi/asia-pacific/4754519.stm>.

<sup>13</sup> Ibid.

<sup>14</sup> [http://www.stdaily.com/gb/stdaily/2005\\_3/24/content\\_369202.htm](http://www.stdaily.com/gb/stdaily/2005_3/24/content_369202.htm)

Deleted:

Agricultural runoff and untreated wastewater from rural industries have caused serious degradation in several of China's largest and most famous lakes, such as the Tai and Dianchi. In a 2005 survey of 509 cities, SEPA found that only 23% properly treated sewage before disposal.<sup>15</sup>

These environmental challenges have also produced a range of economic, social and political problems for China's leaders. The health of the Chinese people is endangered by the country's air and water quality: fully 400,000 people are estimated to die prematurely in China from respiratory diseases related to air pollution, and hundreds of millions drink water contaminated with heavy metals and fecal matter. In a number of Chinese cities and towns, the lack of water has begun to impinge on economic development. Xian—home of the terra cotta warriors—for example, announced that it lost US\$250 million in industrial output in 2004 because the city didn't have enough water to run its factories. All told, China's SEPA estimates that environmental pollution and degradation cost the Chinese economy the equivalent of 10% of GDP annually. Perhaps most troubling for China's leaders, the environment has become one of the leading causes of social unrest. The Chinese media have reported that there were 50,000 environment-related protests in China during 2005, some of which spiraled out of control resulting in violence and even deaths.

China's approach to environmental protection is modeled on the country's economic reform strategy: maintain a small central bureaucracy, devolve authority to local officials, engage the international community and support private initiative, in this case NGOs and the media.

The result of this strategy has been a patchwork of environmental protection, in which very few cities—those with proactive leaders, relatively high per capita GDP and strong ties to the international community—have begun to make strides in improving their environmental situation, while most of the rest of the country falls further behind. China's leaders have not provided a felicitous institutional infrastructure and policy environment for effective environmental protection. The system is characterized by weak enforcement of environmental protection laws, widespread corruption, constraints on the activities of NGOs and the media, still nascent rule of law, significant subsidization of natural resources such as water which promotes waste, and fines that are set too low to encourage behavioral change. Underpinning China's environmental challenges, therefore, is not only the rapid industrialization of the past quarter century but also a political approach to environmental protection that is insufficient to meet these challenges.

### **Regional and Global Implications**

China's domestic environmental problems are playing out dramatically on the world stage. China has become the first or second largest contributor to many of the world's most vexing environmental challenges: climate change, the illegal timber trade, and marine pollution. At the same time, China's strong engagement with the international community provides it with access to new technologies, financing and policy approaches

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<sup>15</sup> China reports cities suffering from severe air pollution," People's Daily Online (September 6, 2006).

that enhance its ability to change course. To date, China's record in utilizing this access effectively to address global environmental issues is mixed, suggesting that only a strong economic incentive embedded in the environmental policy approach itself—one that is clearly and immediately realized—is enough to overcome both the drive to develop and the institutional weaknesses within the political system.

### *Climate Change*

Climate change has the potential to wreak havoc on the economic and social well-being of much of the world. It promises changing agricultural patterns, rising sea levels, melting glaciers, increased pestilence, more frequent and severe storms, and drought among other economic and environmental challenges. While over time, the world's most industrialized countries and regions—the United States, Japan and the EU—have been the dominant contributors of the greenhouse gases that cause climate change, China has emerged as perhaps the most significant actor for determining the future course of this global environmental challenge. As a result of its reliance on coal to fuel its economy, China's emissions of CO<sub>2</sub> have tripled over the past thirty years and are now second only to those of the United States. The International Energy Agency has indicated that China will surpass the U.S. as the largest contributor of CO<sub>2</sub> by 2009, a full decade earlier than anticipated.<sup>16</sup> China already uses more coal than the United States, the European Union and Japan combined. (India, which lags well behind China in its overall consumption of coal, is nonetheless on track to become a major CO<sub>2</sub> contributor over the next 10 years, and is already the 5<sup>th</sup> largest contributor of greenhouse gases globally.) Indeed, unless China takes dramatic action to reconstitute its energy mix or takes advantage of the most advanced clean coal technologies, the increase in global warming gases from China's coal use will probably exceed that for all industrialized countries combined over the next 25 years, surpassing by five times the reduction in such emissions that the Kyoto Protocol seeks.<sup>17</sup>

For China, itself, the impact of climate change is predicted to be quite significant. Beijing recently released the results of a four-year study on the likely impacts of climate change. The report predicts that the output of major crops such as wheat, rice and corn will fall by up to 37% in the second half of the century.<sup>18</sup> Precipitation may decline by as much as 30% in three of China's seven major river regions: the Huai, Liao, and Hai. The Yellow and Yangtze Rivers, which derive much of their water from Tibetan glaciers, will initially experience floods and then drought as the glaciers melt.<sup>19</sup> Moreover, according to the World Bank, a one-meter rise in the sea level will cost China's economy 2.4% of GDP. A five meter rise will cost 11%.<sup>20</sup> At the same time, Chinese meteorologists are

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<sup>16</sup> Tom Holland, "Pollution Woes can turn China into Green Industry Leader," *South China Morning Post* (April 3, 2006).

<sup>17</sup> Keith Bradsher and David Barboza, "The Energy Challenge: the Cost of Coal," *New York Times* (June 11, 2006), p.1.

<sup>18</sup> "Rising Temperatures Threaten China's Food Output," *People's Daily* (January 4, 2007).

<sup>19</sup> "Scientists Reveal New Global Warming Theories that Threaten China," *China Daily* (November 16, 2006).

<sup>20</sup> Tom Holland, "Pollution Woes can turn China into Green Industry Leader," *South China Morning Post* (April 3, 2006).

concerned that precipitation may decline by as much as 30% by 2040 in the Huai, Liao and Hai river regions.<sup>21</sup> As in the United States, weather-related disasters are also being linked to climate change: in 2006, such disasters resulted in more than \$US25 billion in damages.<sup>22</sup> Shanghai and other parts of coastal China could be largely submerged as sea levels rise in the East China Sea.

At one level, China's policy response to global climate change has been impressive. It signed on to the Kyoto Protocol to the United Nations Framework Convention on Climate Change (as an Annex 2 country<sup>23</sup>), it joined the Asia Pacific Partnership on Clean Development and Climate, and it has outlined a series of important domestic policy initiatives designed to improve its energy use pattern.

Within the framework of Kyoto, the international community has expressed significant excitement concerning the potential for China to be a leader in the key mechanism undergirding the convention: the clean development mechanism (CDM) and carbon trading market.<sup>24</sup> According to one report, China already accounts for 60% of the carbon credits trading under the CDM,<sup>25</sup> and successes are being touted in the Chinese and international media. Nanjing Iron and Steel, for example, has installed the most advanced equipment to capture emissions from its blast furnaces and will use the gas to generate power. It will then sell carbon credits to an Italian government fund through the World Bank. Similarly, Juhua, a Chinese chemicals company, is selling CO<sub>2</sub> credits to Japanese companies. According to an Asian Development Bank expert, there is the potential for China to generate an annual revenue stream of up to US\$2.25 billion from participating in CDM projects.<sup>26</sup>

Still, realized CDM projects are few in number. As of March 2007, only forty-one projects were actually registered in China. (In contrast, India has 124 CDM projects on the ground.) Moreover, some red flags are being raised both in and outside China concerning new bureaucratic obstacles to CDM that may, in fact, diminish China's attractiveness to international partners over time.

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<sup>21</sup> "Less Greenhouse gases to help balance precipitation in China's major rivers," Xinhua News Agency (July 8, 2006).

<sup>22</sup> "China to Get Warmer in 21<sup>st</sup> Century," *China Daily* (February 19, 2007).

<sup>23</sup> Unlike Annex 1 signatories, Annex 2 countries have no obligations to meet targets or timetables for greenhouse gas emissions reductions.

<sup>24</sup> The Clean Development Mechanism (CDM) was developed so that developers of registered projects to reduce greenhouse gas emissions or produce clean energy can earn carbon credits that they can then sell to polluters that have mandatory emission-reduction targets in other countries. In general, countries such as Brazil, India and China are considered good hosts for such projects because it is cheaper to take action than in more advanced countries where tougher emission measures are already in place. Projects might include funding alternative energy production, waste heat and gas recycling projects and reforestation efforts among others. (Eric Ng, "China to pace trade in carbon credits," *South China Morning Post* (May 23, 2006).

<sup>25</sup> Antoanta Bezlova, "Investors on e-mission to China," *Asia Times* (November 29, 2009).

<sup>26</sup> "ADB to Help China Tap into Multi Billion Dollar CDM Potential," <http://www.adb.org/media/printer.asp?articleID=10594>

Beijing has been setting curbs on foreign engagement to address climate change. The government has insisted that the main benefits of projects—both financial and technological—should be reaped by China. As one report noted, “Beijing considers emissions reductions a national resource like oil or gas and limits overseas investment to less than 50%.”<sup>27</sup> That means that the China-based partner in any CDM project must be a wholly or majority-owned Chinese venture. Some foreigners also complain that this means putting risk in the hands of someone who doesn’t have the necessary experience.<sup>28</sup>

Moreover, the Chinese government is actively discriminating in favor of CDM proposals that transfer technology and advance the country’s capacity in renewables, energy efficiency, and methane recovery. Reforestation projects or projects that propose to reduce HFC-23—a greenhouse gas used for refrigerants with global warming potential more than 11,000 times that of CO<sub>2</sub>—are less attractive because they do not serve China’s domestic development needs nor provide technology transfer.<sup>29</sup> It wants energy efficiency and renewable energy projects that will help alleviate poverty in the countryside.<sup>30</sup> Wind power projects now make up almost half of the approved CDM projects.

In addition to the Kyoto Protocol, China has joined the Asia-Pacific Partnership on Clean Development and Climate that involves six Asian-Pacific countries: Australia, China, India, Japan, the Republic of Korea and the United States. The Partnership is premised on the idea that a regulatory framework such as Kyoto is not the most effective way to meet the challenge of global climate change and stresses instead that developing and implementing “market-worthy technologies” will be more effective. To date, however, the partnership is characterized overwhelmingly by information-sharing, some capacity building, and continued research into improving technologies. While these are all important aspects of developing an effective response to climate change, they do not represent actual emission-reducing activities. It is also unclear what the incentive will be to implement these new policy changes or technologies in a country such as China unless the incentive and enforcement structure are reformed.

On the domestic front, the Chinese leadership has also announced a series of steps to improve its pattern of energy use, even as it increases overall energy consumption. Premier Wen Jiabao has promised to decrease energy use per unit of GDP by 20% over the next five years; China has pledged to increase the percentage of renewable energy in its overall energy mix to 10% by 2010, and there are tough energy efficiency codes in place for new construction throughout China.

Such targets and efforts, however, have often proved elusive in the past. In 2002, the Chinese government pledged to cut SO<sub>2</sub> by 10% by 2005; the result was an increase

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<sup>27</sup> Emma Graham-Harrison, “China’s Fierce Kyoto Rules Irk Foreign Investors,” Reuters, September 25, 2006.

<sup>28</sup> “Foreign Curbs Threaten China Lead in Global Emissions Trade,” Reuters (September 25, 2006).

<sup>29</sup> Keith Bradsher, “Outsize Profits and Questions, in Effort to Cut Warming Gases,” New York Times (December 21, 2006).

<sup>30</sup> World Bank Press Release, “State of the Carbon Market Report Update Shows Strong Impact of Asia in the Market,” <http://web.worldbank.org/wbsite/external/countries> (November 28, 2006)

of 27%.<sup>31</sup> Moreover, China is building one new coal-fired power plant per week; and few of these are being built to western standards because it requires importing costly equipment.

### ***The Timber Case***

A second issue of concern is China's growing impact on the global trade in illegal timber. China's booming economy and its efforts to protect its own forests have made China the second largest importer of wood products in the world, and Chinese demand for timber and timber products is growing exponentially. During 1993-2005, imports more than tripled; and according to the international environmental NGO WWF, China's demand for timber, paper and pulp will likely increase by 33% again during 2005-2010.<sup>32</sup> China is now the world's largest plywood producer and exporter. Its export market has grown from less than 1,000,000 m<sup>3</sup> annually in 1998 to nearly 11 million m<sup>3</sup> in 2004. China is also rapidly becoming the number one producer of furniture, floorboards, and various paper products.

The United States, Japan and the EU provide a large and growing market for China's timber products. At the same time, China's urbanization plans for the next two decades necessitate enormous investments in housing and infrastructure and will increasingly put demands on the world's timber resources.

Over the past almost decade, China's leaders have also become increasingly concerned about their own forest resources, putting human and financial capital behind efforts to protect their much-diminished forests and undertake reforestation campaigns. These efforts became especially urgent in the aftermath of the flooding of the Yangtze River in 1998 in which at least 3000 people were killed, 52 million acres of land were inundated, and \$20 billion in economic damages was incurred. Rampant logging, along with the destruction of wetlands was blamed, and China's leaders banned logging throughout much of western China. The result has been an ever growing outward quest for China to fill its timber needs, as well as those of the international community, from the forests of the rest of the world.

With such rapid and dramatic growth in Chinese demand, little has been done in the majority of timber-rich countries to think strategically about how to manage their remaining forest resources and to protect against rampant illegal logging. Already, an estimated 50% of China's total timber imports are reported to be illegal.<sup>33</sup> The illegal timber trade between East and Southeast Asia, alone, is estimated at \$2.5 billion annually.<sup>34</sup>

Chinese logging companies are a principal source of this illegal timber trade. These companies, now present throughout Southeast Asia, Russia, Africa and the

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<sup>31</sup> Bradsher and Barboza, op cit. , "Pollution from Chinese Coal Casts Shadow,"

<sup>32</sup> Dennis Chong, "Russia: Industry plunders forests," Standard (March 27, 2005).

<sup>33</sup> "A Choice for China: ending the destruction of Burma's northern frontier forests, A briefing document by Global Witness (October 2005), p.24.

<sup>34</sup> EIA/Telepak, "Stemming the Tide: Halting the Trade in Stolen Timber in Asia," p.1.

Amazon, have been cited and fined for their poor logging practices. According to the International Non-governmental Organization Global Witness, for example, Chinese companies are carrying out large-scale, unregulated logging and mining operations in Myanmar: “Large parts of forest along the China-Myanmar border have been destroyed, forcing [Chinese] logging companies to move even deeper into Myanmar’s forests in their search for timber.”<sup>35</sup> Within Africa, illegal timber exports to China have been soaring, with estimates as high as 70% of total timber exports from Gabon, and as much as 90% from Equatorial Guinea. Even for African countries that have attempted to protect their forests, China poses a significant challenge. In the case of Mozambique, for example, Chinese middlemen hire local license holders to cut timber, then funnel it through informal ports and transfer it to Chinese ships offshore.<sup>36</sup>

Russia, too, has become an increasingly important source of China’s timber imports. Over 40% of China’s total log imports are now derived from Russia. This burgeoning trade poses a particular challenge: “[Siberia and Russian Far East] forests are host to one-fifth of the world’s forests, the value of biodiversity in the region is immeasurable. Besides some of the wildest, most pristine places on the planet, Russia’s forests are home to a number of endangered species....As well, they play an important role as carbon sinks to mitigate climate change, second only in effectiveness to Brazil’s dense Amazon forest. Once these forests are irresponsibly cut for short term gain, these values are gone forever.” China is already the top export destination for Russia’s timber, and WWF estimates that as much as 20-50% of this Russian timber is illegally logged.<sup>37</sup>

Illegal timber trade is flourishing for several reasons. There is little government oversight in either China or the timber-rich countries. There are few controls placed within the host countries on loggers and virtually none at the point of cross border trade—either by land or by sea into China’s ports. Illegal practices such as logging without a license, logging in protected areas, taking protected tree species, and logging outside of concession boundaries are widespread practices everywhere China does business.

Responsibility for better management of the world’s forests remains overwhelmingly a job for the governments that manage these forests. Given the global environmental security implications, however, China as well as the United States should become far more deeply engaged.

Responses from the Chinese side take two forms: denial and pledges to improve. Cao Qingyao, the spokesperson for China’s State Forestry Administration, for example, stated in February 2006, “It’s a common responsibility of the world’s countries to protect and develop forest resources but not the responsibility of a single country or region. The Chinese government has consistently performed its internationally-shared responsibilities, opposed to and firmly cracked down on illegal deforestation and illegal

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<sup>35</sup> Ibid.

<sup>36</sup> Thornton testimony, p.6

<sup>37</sup> Chong, Op. cit., “Russia: Industry plunders forests, March 27, 2005.

imports. China enforces rigid control over imports.<sup>38</sup> Or as Lei Jiafu, Vice Head of the Chinese State Forestry Administration stated in January 2005, “It is out of the question that the country would satisfy its domestic demands by increasing tree felling from neighboring countries.”<sup>39</sup>

In other instances, under fierce pressure, China has pledged to improve its practices, promising, for example, to work with the Indonesian government to stem the import of illegal timber. This was precipitated by the seizure of two Chinese-owned vessels carrying large amounts of illegal logs. However, China has not taken any action to enact the commitments. This was followed by a pledge to “only allow in timber [from Burma] which has been lawfully licensed.”<sup>40</sup> When China failed to take action in the case of Burma, the Myanmar government arrested more than 400 mainland workers and put them in jail for eight months until June 2006, when Beijing and Rangoon reached agreement. In the immediate aftermath, Chinese checkpoints were closed to log transports,<sup>41</sup> but more recent inspections have indicated that the illegal timber trade between the two countries is reviving.

China has also signed on to a number of regional and global agreements to combat the illegal trade in timber, including the Santiago Declaration, the International Tropical Timber Agreement, an East Asian Forest Law Enforcement and Governance agreement, and a memorandum of understanding with Indonesia concerning cooperation in combating illegal trade of forest products. However, China does not have any implementing regulations or mechanisms in place to monitor effectively whether logs are imported legally or illegally.

### ***Marine Pollution***

China’s contribution to marine pollution is an issue that remains below the radar of much of the international community but of serious concern to the world’s environmental activists. The international environmental NGO WWF reports that the Yangtze delta has become “the biggest cause of marine pollution in the Pacific.”<sup>42</sup>

China has 18,000 km of coast lines and 3 million km of sea areas. Coastline inspections by SEPA and the State Oceanic Administration found that in “nearly half of the 20 coastal cities inspected, more than 50% of the sewage is discharged into the sea untreated.”<sup>43</sup> Gao Ying, an expert with the journal *Oceanographic Studies* argued that the Yangtze River Delta, Pearl River Delta, Bohai Rim Area, Liaoning Province and Shanghai are all suffering from increasing pollution.<sup>44</sup> Overall, China dumped 31.7 billion tons of wastewater into the Pacific in 2005, which represented nearly a 100% increase

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<sup>38</sup> “China able to handle its timber demand,” People’s Daily Online (February 28, 2006) <http://www.illegal-logging.info/news.php?newsID+1290>

<sup>39</sup> “A Choice for China,” op cit., Global Witness report. P.24.

<sup>40</sup> “China must act on pledge to end illegal Burmese timber imports,” Press Release Global Witness (March 8, 2006).

<sup>41</sup> “400 Illegal Logging workers sent home from Myanmar,” Reuters (June 18, 2006).

<sup>42</sup> “On the Water Front,” *The Guardian* (November 11 2004).

<sup>43</sup> “China Admits to Marine Pollution Problem,” United Press International (August 5, 2004).

<sup>44</sup> “Marine Protection Action,” Business Daily Update (October 16, 2006)/

from 2000<sup>45</sup> and accounted for 60% of the total waste water produced by the country.<sup>46</sup> According to the China Ocean Quality Reports, 80% of this pollution arises from land-based activities.<sup>47</sup> Primary pollutants include heavy metals such as cadmium, copper and arsenic.<sup>48</sup> In the East China Sea, which is among the world's largest fisheries, 81% of the sea was rated category four for pollution—not suitable for fishing—this represents an expansion from 53% in 2000.<sup>49</sup>

According to China's State Oceanic Administration, of the 18 coastal ecological monitoring zones, six were deemed unhealthy, seven, moderately healthy, and only five healthy. There were 270 waste water discharge points in fishing areas, posing a great threat to the safety of marine life and the quality of seafood; and another 70 were found in scenic areas, threatening surrounding natural environments.<sup>50</sup>

China also pollutes the waters of Cambodia, Malaysia, Thailand and Vietnam. Rivers flowing through these countries are delivering at least 637,000 tons of nutrients—which contribute to toxic algal blooms and dead zones (de-oxygenated areas of sea)—to the coastal waters of the Sunda Shelf. Over 50% of these nutrients originate in China.<sup>51</sup>

China's own assessment of the roots of its large and growing contribution to marine pollution is not surprising: rapid growth of coastal areas and poor enforcement of marine protection and wastewater treatment laws.<sup>52</sup> In addition, bureaucratic politics complicate efforts to respond to marine pollution problems.

The recent case of the Bohai Sea clean-up campaign underscores the complicated nature of China's marine protection effort. In November 2006, SEPA announced that the Bohai Green Sea Action campaign, underway since 2001, “effectively controlled the pollution from waste water and rubbish treatment plants, oil decks and improved coastline bio-agriculture.”<sup>53</sup> On this basis, similar Green Sea Action Plans for seven provinces, municipalities and autonomous regions, as well as the Pearl River Delta and Yangtze River Delta areas were announced.

The State Oceanographic Administration, which maintains overall responsibility for marine issues and monitoring, however, offered a very different assessment, arguing that “almost no river that flows into Bohai is clean and it will become a dead sea in a matter of a dozen years if no effective measures are taken to curb the pollution.” The

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<sup>45</sup> “Fishing for a Solution,” *Business Daily Update* (October 16, 2006).

<sup>46</sup> “China Drafts National program to protect marine environment,” Xinhua News Agency (October 19, 2006).

<sup>47</sup> “Fishing for a Solution,” *Business Daily Update* (October 16, 2006).

<sup>48</sup> Kevin Huang, “Alert over cadmium in Pearl River Estuary,” *South China Morning Post* (March 29, 2006), p.5.

<sup>49</sup> “One of the World's Top Fisheries Dying,” Xinhua New Service (August 17, 2006)

<sup>50</sup> “Heavy Pollution of China's Marine Zones,” *China Through a Lens*

<http://www.china.org.cn/english/2006/jan/154654.htm>

<sup>51</sup> “Integrated Water Management Key to Cleaning Up Oceans,” (October 19, 2006)

[http://english.sepa.gov.cn/zwxhjyw/200610/t20061019\\_94871.htm](http://english.sepa.gov.cn/zwxhjyw/200610/t20061019_94871.htm)

<sup>52</sup> “China's Political Advisors Call for Efforts to save “dying” sea,” Xinhua News Service (March 9, 2006).

<sup>53</sup> “Marine Protection Action,” *Business Daily Update* (October 16, 2006).

agency's experts pointed out that the content of heavy metal detected in the mud of the sea bottom was 2000 times that of the national standard. Fish were losing their reproductive abilities, and there were no large groups of any variety of fish, crab or other crustaceans to be found.<sup>54</sup> Forty-three out of 52 rivers flowing into the Bohai Sea were severely polluted.<sup>55</sup> (The Bohai Sea absorbs nearly 5.7 billion tons of sewage and another two million tons of other solid waste every year.<sup>56</sup>)

When Chinese media highlighted the differing assessments, deputy SEPA director Zhu Guangyao stated, "We are authorized by the State Council to release the latest information about the national campaign to clean up the Bohai Sea, which started in 2001 and is led by SEPA, but we've noticed that some government department has published their views in their own interest." State Oceanographic Administration officials, meanwhile, commented that their statistics, based on regular surveys by more than 8000 monitoring posts along the mainland coast, should be telling and that their "grim" assessment was not included in SEPA's official report.<sup>57</sup>

In support of such marine clean-up campaigns, China has set out a number of ambitious goals for wastewater treatment, promising to treat about 70% of its urban wastewater in the next five years and to try to decrease pollutants by 10%. There are currently 145 wastewater treatment plants under construction in coastal areas.<sup>58</sup> China has also promised to shut down heavily polluting projects and punish violators to ensure that by 2010 at least 85% of the sewage and 80% of the waste are properly handled; offshore oil producers, shipping companies and ports in the area have been ordered to prevent oil leakages and the disposal of waste at sea; and all aquatic farms and coastal engineering projects will be obliged to adopt environmental protection efforts.<sup>59</sup> It also has joined the relevant conventions and organizations such as the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, which offers information sharing and capacity building assistance, as well as financing for some projects.

Past experience with marine clean-up campaigns, however, does not bode well for the future. As one Chinese expert commented about the Bohai Sea project, "One third of the scheduled projects have still not started and "many" other projects have been left uncompleted as a result of unfulfilled investment commitments."<sup>60</sup> Moreover, previous pushes by the Chinese government to improve the rates of industrial and municipal wastewater treatment have largely failed. In 2004, SEPA inspected the sewage treatment plants that had been built during the tenth five year plan and found that only half of them were actually working: the other half were closed down because local authorities considered them too expensive to operate.

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<sup>54</sup> "China's Political Advisors Call for Efforts to save "dying" sea," Xinhua News Agency (March 9, 2006).

<sup>55</sup> Jiangtao Shi, "Bohai Sea will be dead in 10 years," South China Morning Post (October 19, 2006).

<sup>56</sup> Jiangtao Shi, "Bohai Sea Will be dead in 10 years," South China Morning Post (October 19, 2006)

<sup>57</sup> Jiangtao Shi, "Marine Pollution Divides State Bodies," South China Morning Post (October 20, 2006), p.4.

<sup>58</sup> "Marine Environment threatened by Sewage," China Daily (October 17, 2006).

<sup>59</sup> "China's Bohai Sea Severely Polluted," Xinhua News Agency (October 20, 2006).

<sup>60</sup> "China's Political Advisors Call for Efforts to save "dying" sea," Xinhua News Service (March 9, 2006).

## Looking Forward: China's Next Steps

China's extraordinary economic development has contributed to significant degradation and pollution of the country's resources. Air and water pollution, land degradation and the declining availability of resources, such as water, now top world statistics and are beginning to affect the country's economic growth, public health and social stability.

At the same time, this economic dynamism, transformation into a market economy, and integration into the global economy enable China's leaders to experiment with a new platform of policies. The Clean Development Mechanism and carbon market are rooted in a belief that China's growing economy and transition to a market economy will permit new approaches to environmental protection to succeed.

What will China look like a decade from now, and what kind of impact will it exert on the global environment? Broadly speaking, China's leaders know what needs to be done to transform the country from one of the world's greatest pollution contributors to one of the world's environmental protection leaders.

The development of an institutional framework for environmental protection and access to new technologies and policy approaches—as well as continued economic growth—are all necessary for China to meet the environmental, public health, and economic needs of its people over the long term and diminish the country's impact on the global environment. In concrete terms at least three preconditions need to be met: economic growth continues at 8-10% per year, providing the economic wherewithal to invest in environmental protection; China's integration into the global economy continues to afford it access to a wealth of environmental technologies and policy approaches; and critically, Beijing and local authorities develop the institutional incentives and disincentives for effective environmental protection. China's leaders and urban planners must also take advantage of sweeping societal changes, such as the process of urbanizing 300 million people by 2020, to utilize the most energy efficient building technologies, environmentally-sound transportation infrastructure, and wastewater treatment and water recycling efforts.

China's leadership also increasingly realizes that the country cannot become a modern efficient economy, fully integrated into the international system, without establishing an independent judiciary, realistic natural resource pricing, tougher fines and enforcement, and greater transparency and official accountability. The State Environmental Protection Administration needs to gain in bureaucratic strength, supported by top leaders such as Zeng Peiyan and Wen Jiabao, to ensure that enforcement of tough energy standards or pollution control is a top priority. Beijing must also find a mechanism—whether political or economic—to spur local leaders to do the right thing or face the loss of their jobs. Protection of nongovernmental organizations and an open media are needed to bring increased pressure to bear on local authorities and

businesses—both domestic and international—to adhere to environmental laws and regulations.

Despite fuel economy standards that surpass those of the United States, China's transportation sector has the potential to undermine much of the leaders' efforts to improve air quality. As China's transportation sector grows, the Chinese government must also move to reduce gasoline subsidies, thereby encouraging growth in the range of alternative fuel vehicles.

The desire of China to be a global power with influence that extends well beyond the economic realm also should motivate the country to become an example in the environmental arena. In the short term, the Olympics is providing a spur for environmental protection, in particular for Beijing and the surrounding areas, but increasingly for the entire country as Olympic pride (and fear of loss of face) is enveloping the country. Still, more needs to be done on the international front. For example, China should voluntarily adopt targets and timetables for reducing its contribution to climate change that will be enforced no matter the post-Kyoto regime.

If these structural changes are made, other aspects of environmental policy will fall into place. Cleaner production and a wide range of environmental technologies will not be simply staged experiments but rather viable policy approaches and mechanisms for protecting the environment. Overall, in ten to twenty years, China has the potential to transform the global environment by leading in environmental protection rather than by leading in environmental pollution, but it will require the transformation first of all of the country's own economic and political infrastructure.

### **How Does the United States Fit In?**

As China moves to improve its environmental protection record while continuing to grow its economy, the United States has an important role to play in moving this effort forward. Many in the United States and the rest of the world are rightly concerned about China's contribution to climate change, the loss of marine biodiversity and declining fish stocks, and the devastation of many of the world's most environmentally-significant forests. Yet the United States is a significant contributor in its own right to several global environmental problems. In this context, addressing the challenge of China's role has as much to do with identifying specific areas of cooperation as it does with establishing the U.S., itself, as a leader in addressing challenges such as global climate change and the illegal timber trade.

With regard to energy use and climate change, for example, the United States should take steps to improve its own energy efficiency record, enhance energy conservation practices, and expand the use of alternative energies, all areas in which the United States lags well behind Japan, for example. Ratifying Kyoto would also permit the U.S. to play a more active role in working with China by participating in the CDM and carbon market activities. Similarly, the United States has an important role to play in reversing the trends in the illegal timber trade. The value of the wood-based products

which the U.S. is likely to import from China alone during 2006 will exceed \$3 billion. Import and procurement regulations that insisted on a verifiable chain of timber processing from the point of origin would be a first important step toward slowing the growth of the illegal timber trade.

Certainly there is significant room for the United States to work with China to build capacity within the country to address these global environmental challenges. Many International NGOs, multinationals, universities and U.S. government agencies are already active in joint technology development, training, and the provision of new policy approaches, particularly with regard to global climate change. The INGO NRDC, for example, has been working intensively with the Chinese government to develop and implement energy efficiency codes for new buildings in China. In the lead-up to the Olympics, with U.S. government assistance, Beijing's 44 new Olympic dormitories to house 17,000 athletes will all be LEED-certified, and the complex will include a zero-energy health clinic. General Electric and other US firms are actively engaged in pushing alternative energies, more fuel efficient engines for aircraft and locomotives, and clean coal technologies. Nonetheless, there is always the potential for more such cooperation.

There is not yet an economic or technological incentive equivalent to CDM or the carbon market to encourage stronger Chinese action on issues such as the illegal timber trade or marine pollution. In the case of the timber trade, international NGOs have a long list of measures they would like to see China adopt: join timber certification programs such as those in the UK and the United States; increase domestic production through policy reforms such as fees, regulations, tax reforms for legal and sustainable wood sourcing, establish verification systems for sourcing into China.<sup>61</sup> None has received any traction to date.

In one promising case, however, World Wildlife Fund, along with other International NGOs, is working with a Chinese company, Shanghai Anxin Flooring Company, to bring its practices up to world standards. Anxin's Beijing factories have already passed ISO certifications and, in Brazil, where the company does much of its logging, the company has established strict rules against logging on steep slopes and in important wildlife habitats.<sup>62</sup>

Since much of China's challenge rests at the level of enforcement, the United States and several US NGOS, such as the American Bar Association, also have ongoing efforts to support the development of rule of law and civil society. These efforts speak to the core of the environmental protection effort in China today.

The reality, however, is that much of the burden and opportunity for China to become a leader in addressing these global environmental challenges rests within China

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<sup>61</sup> Kerstin Canby, "Questions About the Legality of China's Wood Product Imports," Forest Trends, Vancouver, (January 2006).

<sup>62</sup> The Forests Dialogue Review, "Practical Actions to Combat Illegal Logging, Summary of a multi-stakeholder dialogue on best practice for business and civil society," (7-10 March 2005, Hong Kong, SAR, PRC)

itself. The Clean Development Mechanism and carbon market alone will not be sufficient to prevent Chinese greenhouse gas emissions from swamping efforts by the rest of the world to reduce their contributions. No amount of capacity building, training and even technology transfer from the international community can transform China's contribution to the illegal timber trade and marine pollution.

Real change will only arise from strong central leadership and the development of a system of political and economic incentives within the country that make environmental protection a much easier, more institutionalized effort for local officials and the Chinese people. This may mean raising the price of natural resources, such as water, to encourage conservation and recycling. Fines should be increased and penalties enforced for polluting factories. And there must be greater accountability among local officials, whether through political incentives, such as promotion opportunities, grass-roots oversight, transparency and fairness in the judicial system or even more significant moves toward political reform. Without such reforms, much of the work of China's environmentalists and certainly that of the international community will continue to be at the margins and the threat that the environment will become a more politically-charged element in the Sino-U.S. relationship will only increase.