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ENVIRONMENTAL LAW WITH CHINESE CHARACTERISTICS

Eric W. Orts*

Environmental degradation is an increasingly serious issue in China. Economic growth without regard to environmental consequences can no longer guide policy. Increasing appreciation of the health problems and other adverse social effects of environmental problems, combined with international pressure for improvement, has recently led the governing elite in China to understand that economic development must include environmental protection. The passage of a major air pollution statute in 2000, for example, resulted from a decision at the highest reaches of government that "curbing pollution would be a priority."¹ In part, the central government has been motivated by the realization that the gravity of environmental problems in China could lead to social and political instability.²

The financial measure of the government's political will is considerable. After spending \$43.5 billion to address environmental problems from 1996 to 2000, the government pledged to double expenditures over the next five years to \$84 billion.³ Its announced goal is to reduce air, water, and soil pollution by ten percent from 2000 benchmarks.⁴ In preparation for the Olympics in 2008, Beijing alone expects to expend more than \$30 billion on improvements to achieve an environmental transformation of the city.⁵

* Professor of Legal Studies and Management, The Wharton School, University of Pennsylvania; Eugene P. Beard Faculty Fellow, Center for Ethics and the Professions, Harvard University (2002–2003). For comments, I thank participants in the symposium on the Rule of Law in China at William and Mary School of Law and students at Wharton who heard various early versions of some of the ideas presented here. In particular, I thank Andrew Finkelstein, Stefan Krasowski, David Ho, and Kin Yee Wong who were students in my environmental management course. I also thank participants in the World Resources Institute's Business, Environment, Learning and Leadership conference held at the Bren School of Environmental Science and Management, University of California, Santa Barbara, as well as attenders of a Wharton West conference on the Future of Chinese Management.

¹ William P. Alford & Benjamin L. Liebman, *Clean Air, Clean Processes? The Struggle Over Air Pollution Law in the People's Republic of China*, 52 HASTINGS L.J. 703, 747 (2001).

² *Id.* at 748.

³ Michael A. Lev, *Clearing Skies Over China: Demonstrating Political Will, Beijing Tackles the Cleanup of Some of Earth's Most Polluted Cities*, CHI. TRIB., Feb. 2, 2002, at 1.

⁴ *Id.*

⁵ Alan Abrahamson, *Rings, Ka-Ching in Beijing: Preparing for 2008 Games, a \$30-Billion Facelift Shows China's Cultural Evolution . . . or Is That Revolution?*, L.A. TIMES, July 13, 2002, at D1. Planned environmental improvements run from a modernized sewage treatment system to the planting of thousands of acres of trees. *Id.* At least, the government wants to avoid embarrassment on environmental as well as other grounds. See, e.g., *Be Prepared*, ECONOMIST, June 13, 2002, at 15 (predicting that China will be "nervous

Given the political commitment at the top to address environmental issues in China, however, the practical problem of regulatory strategy remains. How can China and its legal system best increase levels of environmental protection? Given that economic growth remains the highest priority for China, how can the country protect its natural environment without compromising economic expectations? In this Article, I suggest some answers to these questions by considering the type and magnitude of environmental problems in China as well as different methods of environmental regulation that might be adopted to combat them.

In approaching this large problem of choice of environmental regulatory strategies in China, I begin with an assumption that any recommendations coming from an outside Western observer must be careful to take into account the unique legal, political, and cultural situation of Chinese society. Direct "transplants" of Western environmental laws are unlikely to take root very easily, if at all.⁶ In particular, cutting-edge regulatory technology — such as sophisticated market-based permit trading programs — are unlikely to succeed in contemporary China. To borrow a metaphor, a Cadillac should not be recommended to a country that can afford only a Volkswagen.⁷ Environmental solutions for China should focus instead on building the basic institutional infrastructure and capacities needed for an effective and efficient administrative legal system, as well as strategies for encouraging the recognition and enforcement of basic legal rights to property, contracts, and freedom from bodily harm. Close attention to the development of indigenous nongovernmental organizations (NGOs) and independent, free-standing business enterprises that have the power to contest important environmental issues with the government would also be likely to improve the prospects for environmental protection in China.

It is not accidental that some of the largest environmental disasters in modern

and introspective" in its role as Olympic host). Concerns about human rights in China played a major role in Beijing's failure in 1993 to win a bid for the 2000 Olympics. Abrahamson, *supra*.

⁶ See, e.g., Jacques deLisle, *Lex Americana?: United States Legal Assistance, American Legal Models, and Legal Change in the Post-Communist World and Beyond*, 20 U. PA. J. INT'L ECON. L. 179, 259 (1999) (noting that the transplanting of Western legal concepts to communist regimes poses "peculiar and especially problematic features").

⁷ I owe this metaphor to Dan Tarlock, though he bears no responsibility for the context in which I am using it. An automotive analogy for Chinese environmental problems may fit in more ways than one. "The automobile," one thoughtful observer has written, "may well be the ultimate symbol of the modern environmental crisis." MARK HERTSGAARD, *EARTH ODYSSEY: AROUND THE WORLD IN SEARCH OF OUR ENVIRONMENTAL FUTURE* 90 (1998). Given the immense environmental problems that continued Chinese economic growth powered mostly by internal combustion engines would produce, hydrogen-powered Volkswagens or hybrid Hondas are likely to have a brighter future in China than gas-guzzling Cadillacs.

times have occurred in communist countries such as the Soviet Union and China.⁸ Authoritarian regimes repress dissenting opinions on environmental as well as other political issues of public concern. Ultimately, the potential solutions to China's environmental problems will depend on how well the country is able to manage its "opening" to the global economy and the political pressures and opportunities that economic liberalization will bring.

At the moment, there is some reason for hope, given the government's recognition of the seriousness of environmental problems as expressed in a wave of recent legislation. Dozens of statutes and hundreds of regulations have been adopted in Chinese environmental law — and for very good reason.⁹ These laws attempt to address what has been described as "environmental degradation of epic proportions."¹⁰

This Article assesses the current state of environmental law in China and recommends some possible future directions for it. Part I reviews some of the major environmental problems facing China, which dwarf similar problems as they appear in most other countries in the world. Part II considers the rise of a nascent "rule of law" culture in China. Although this large project of social construction is only beginning, there are reasons for optimism, at least in the long run, given the strong commitment of resources that the Chinese government has been devoting to the building of a modern legal system almost from scratch. Part III reviews the menu of choices that have been identified to deal with different kinds of environmental problems. Here, I consider what types of environmental law might make the most sense for reformers in China as well as foreign groups who may wish to help China in this area of social and economic development. In other words, I provide some recommendations from an outsider's perspective for how environmental law with Chinese characteristics might unfold with beneficial results in the future.

Again, I wish to emphasize that I do not believe that any particular legal system or set of legal strategies will always provide the "best" approach for any particular country or historical context. Because of different circumstances and constraints,

⁸ See discussion *infra* Part I (describing China's environmental difficulties). For an account of Chernobyl and other aspects of the abysmal environmental record of the Soviet Union, see, e.g., HERTSGAARD, *supra* note 7, at 119–38. Environmental disasters are not, however, limited to authoritarian countries. See *id.* at 138–45 (describing the huge nuclear waste problem at the Hanford, Washington weapons site in the United States).

⁹ William P. Alford & Yuanyuan Shen, *Limits of the Law in Addressing China's Environmental Dilemma*, 16 STAN. ENVTL. L.J. 125, 130 (1997); see also Christopher Van Wyk, *The Role of Equity in Environmental Protection in the People's Republic of China*, 14 GEO. INT'L ENVTL. L. REV. 593, 595 (2002) (noting a "large number of environmental laws and regulatory programs."). For an overview of the avalanche of recent legislation in China, see Eric W. Orts, *The Rule of Law in China*, 34 VAND. J. TRANSNAT'L L. 43, 44–46, 61–64, 72–73 (2001).

¹⁰ Alford & Shen, *supra* note 9, at 126.

the best approach for contemporary China will diverge from the best approaches that might be recommended for the United States, Japan, or elsewhere.¹¹

I. AN OVERVIEW OF ENVIRONMENTAL PROBLEMS IN CHINA

Compared with most other countries in the world, China has quite severe environmental problems. Many of these problems also have spillover effects on China's immediate neighbors and the world as a whole. This Part briefly reviews some of the major problems involved and assesses the gravity of these challenges.

Many if not all problems that affect the condition of the natural environment result from pressures of aggregate growth of both human population and economic activity.¹² With respect to population, China remains the largest country in the world.¹³ One-fifth of the human population is Chinese. In 2001, China's population was 1.3 billion. Recent estimates project a continued increase to a peak of 1.6 billion in 2050.¹⁴ Although China still contains a large proportion of the total human population, the projected leveling off of China's population may be seen as a success of the serious policy measures taken to address this issue, including the controversial but apparently effective "one-child policy." Between 1979, when the policy began, and 1991, China recorded a drop in its fertility rate from 2.8 to 2.0.¹⁵

¹¹ See ROBERT N. STAVINS, *Market-Based Environmental Policies*, in PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION 31, 62 (Paul R. Portnoy & Robert N. Stavins eds., 2d ed. 2000) ("No particular form of government intervention, no individual policy instrument . . . is appropriate for all environmental problems. Which instrument is best in any given situation depends on a variety of characteristics of the environmental problem as well as the social, political, and economic context in which it is being regulated."); Jonathan Baert Wiener, *Global Environmental Regulation: Instrument Choice in Legal Context*, 108 YALE L.J. 677, 681–82 (1999) ("As a first principle, there is no single regulatory instrument that is 'best' for all purposes. Each instrument has its strengths and weaknesses. Like the tennis player who performs best on clay or grass, each regulatory instrument has its best policy terrain; pragmatic choice depends on context.").

¹² The classic treatment of the basic problem remains Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968).

¹³ India, however, is expected to surpass China as the world's most populous country within a few years. Romesh Ratnesar, *The Faces of India's Future*, TIME, Mar. 27, 2000, at 46.

¹⁴ Kari Huus, *The People Bomb: China's Unrelenting Population Problem*, MSNBC NEWS, Sept. 6, 1999, at <http://www.msnbc.com/news/307034.asp>; see also LESTER BROWN, ECO-ECONOMY 18 (2001).

¹⁵ Amartya Sen, *Fertility and Coercion*, 63 U. CHI. L. REV. 1035, 1043–44 (1996) (citing World Bank statistics). As Sen observes, however, the Chinese success in reducing population growth came at considerable cost in terms of basic human rights, as well as unanticipated social consequences such as widespread female infanticide. *Id.* at 1054–55. After further analysis and comparison with some states in India, Sen concludes that China's success in stabilizing population growth owes more to economic growth and increasing

From an environmental perspective, apparent success in stabilizing population must also take into account the huge economic growth rates of China in the last few decades. Population stabilization in China might best be understood as a beneficial consequence of economic growth.¹⁶ From 1978, when Deng Xiaoping first began an "opening" policy to create a socialist market economy "with Chinese characteristics," to 1996, China's economy expanded at a torrid average annual rate of 9.9 percent.¹⁷ More recently, the pace of economic growth has lessened slightly, though annual rates of increase remain between seven to eight percent of Gross Domestic Product (GDP).¹⁸

This remarkable record of economic growth has had the beneficial effect of lifting an extraordinarily large number of people out of poverty in China. According to official statistics, the number of people living on less than sixty-six cents per day fell from 260 million people in 1978 to forty-two million in 1998.¹⁹

At the same time, the rapidity of economic growth in China raises questions about its environmental sustainability. China has paid for fast economic growth with widespread environmental damage. To continue its successful transition to a global market economy, China must find ways to square the incentives of economic development with the preservation of the environmental resources on which social development depends.

To give an overview of the environmental challenges facing China in the years ahead, I list a number of different problems and provide some basic information about them. The list includes such basic environmental issues as the social consequences of the geographically uneven distribution of economic growth in China, water shortages, large-scale water construction projects such as the Three Gorges Dam, widespread deforestation and desertification, biodiversity loss, severe air and water pollution, ozone layer depletion, and global climate change.

individual responsibility rather than the "one-child" policies of governmental coercion. *Id.* at 1055–58, 1060–61.

¹⁶ *Id.*

¹⁷ Lan Cao, *Chinese Privatization: Between Plan and Market*, 63 LAW & CONTEMP. PROBS., Autumn 2000, at 13, 30.

¹⁸ *A Dragon Out of Puff*, ECONOMIST, Apr. 6, 2000, at 4. In the first half of 2002, China's GDP grew by 7.8 percent. Press Release, Embassy of the P.R.C. in the U.S., China's GDP Grows by 7.8% in First Half Year (July 15, 2002), at <http://www.China-embassy.org/eng/32493.html>. Even allowing for the possibility that Chinese officials have overstated economic figures, annual growth rates are still likely to be five or six percent. Compared with most other countries, the recent growth of the Chinese economy is quite strong. See *How Cooked Are the Books?*, ECONOMIST, Mar. 16, 2002, at 45 (stating that, according to China's suspect estimates, it has "the world's fastest growing large economy"). For a general assessment of recent economic success in China, see GROWTH WITHOUT MIRACLES: READINGS ON THE CHINESE ECONOMY IN THE ERA OF REFORM (Ross Garnaut & Yiping Huang eds., 2001).

¹⁹ John Thornhill, *Changing China*, FIN. TIMES, June 14, 2002, at 14.

A. Environmental Consequences of Uneven Economic Growth

Although China's economy has grown very rapidly, the benefits of this growth have been geographically limited mostly to what has been called the "golden coast" of eastern China.²⁰ GDP per person in 1998 exceeded \$1000 in the eastern coastal provinces of Guangdong, Fujian, Zhejiang, Jiangsu, Hebei, and Liaoning, including the major cities of Beijing, Shanghai, Tianjin, and Hong Kong.²¹ The economic wealth for many people in other parts of China, especially in the western and central regions, was significantly less. For example, in Tibet, Gansu, Shaanxi, Guizhou, and Guanxi, GDP per person was less than half that of the golden coast regions, ranging from only \$250 to \$500.²² Unequal trends have continued more recently, with GDP per person ranging from \$1000 to \$3000 in Guangdong, Zhejiang, Beijing, and Tianjin — and more than \$3000 in Shanghai — in 2000.²³ The central provinces remained in the \$500 to \$750 per person range or even lower. Gansu and Guizhou, for instance, experienced little or no growth.²⁴

The social and environmental consequences of this geographically uneven growth are significant. For example, it is estimated that as many as 100 million migrant rural workers now roam from place to place in China.²⁵ They constitute a "floating population" who exist outside of the Maoist danwei system that had been constructed to give each citizen a place to live and work. These migrants therefore are largely outside of direct government supervision.²⁶ The number of migrants also is expected to increase. Although fifty percent of the current population depends on farming, this number is expected to drop to about twenty-five percent in the next several decades.²⁷ In addition to social and political pressures from economic inequality, large-scale movements of displaced workers are likely to increase urban environmental problems resulting from overcrowding and the burden put on the infrastructure for sanitation, transportation, and drinking water quality.²⁸ Problems such as air and water pollution — including acid rain — also concentrate in the regions of the rapidly growing and industrializing eastern coast of China.²⁹

²⁰ *Now Comes the Hard Part*, ECONOMIST, Apr. 8, 2000, at 3.

²¹ *Id.* (citing CHINA STATISTICAL YEARBOOK (1995)).

²² *Now Comes the Hard Part*, *supra* note 20.

²³ *A Dragon Out of Puff*, *supra* note 18, at 4.

²⁴ *Id.*

²⁵ Thornhill, *supra* note 19.

²⁶ Alford & Liebman, *supra* note 1, at 714.

²⁷ Thornhill, *supra* note 19.

²⁸ For a discussion of the political pressures arising from growing economic inequality in China, see *Urban Discontent*, ECONOMIST, June 13, 2002 at 13–14.

²⁹ Air and water pollution problems are discussed in some greater detail below. See discussion *infra* Part I.F.

B. Water Shortages

One of the most important environmental problems in China is that the country is running out of water.³⁰ According to Sheri Liao, who heads Global Village, one of the few independent environmental groups in China, "[w]ater is China's No. 1 environmental problem."³¹ Because of greatly increased industrial use of water, more than half of China's cities have water shortages.³² Half the population — more than 700 million people — drink water that does not meet minimum quality standards.³³ According to Lester Brown of the Worldwatch Institute, the water shortage in China will bring on a crisis not only in China itself, but globally. With its population increase over the last fifty years, China has consumed so much water that thousands of lakes, rivers, and reservoirs have been completely drained.³⁴ The Yellow River first ran dry in 1972 and has run dry for part of each year since 1985.³⁵ Groundwater tables also are dropping rapidly. Fifty years ago, for example, the typical well in Beijing drilled down fifteen feet to reach water. Today, one must drill about 150 feet.³⁶ The same phenomenon describes other parts of the northern plains near Beijing.³⁷

Some observers, including Brown, predict that water shortages inevitably will lead to food shortages.³⁸ Lower water tables will raise food prices in China, given that approximately seventy percent of China's agriculture relies on irrigation.³⁹ As a result, China may well begin to import much of its food, potentially raising food

³⁰ China shares this problem with other developing countries. The lack of drinking water supplies and water for sanitation is one of the major environmental problems today. Half of all people living in the world do not have sanitary waste disposal facilities, and 1.2 billion people lack safe drinking water. *Solutions for a Water-Short World*, POPULATION REP., Sept. 1, 1998 (discussing water-borne diseases), available at 1998 WL 28645190. For general sources on global problems of water shortages, see Malcolm G. Scully, *The Politics of Running Out of Water*, CHRON. OF HIGHER EDUC., Nov. 17, 2000, at B18.

³¹ Michael Dorgan, *China's Water Supply Drying Up*, PHILA. INQUIRER, July 8, 2000, at A1 (quoting Liao); see also Michael A. Gheleta, *Sustaining the Giant Dragon: Rational Use and Protection of China's Water Resources in the Twenty-First Century*, 9 COLO. J. INT'L ENVTL. L. & POL'Y 221, 228 (1998) ("Shortages of water resources are among China's most significant natural resource problems.").

³² Dorgan, *supra* note 31.

³³ *Id.* (citing the World Resources Institute).

³⁴ *Id.*

³⁵ Lester R. Brown & Brian Halweil, *Populations Outrunning Water Supply as World Hits 6 Billion*, WORLD WATCH NEWS RELEASE, Sept. 23, 1999, available at <http://www.worldwatch.org/alerts/990923.html>.

³⁶ Dorgan, *supra* note 31.

³⁷ *Id.* (citing Sheri Laio).

³⁸ *Id.*; Lester R. Brown & Brian Halweil, *China's Water Shortage Could Shake World Food Security*, WORLD WATCH, July/Aug. 1998, at 10, available at 1998 WL 15229359.

³⁹ Dorgan, *supra* note 31.

prices globally as well.⁴⁰

C. Water Construction Projects

To alleviate the expected water shortages in Beijing and other northern cities, the Chinese government plans to build a series of massive canals to divert water northward from the Yangtze River. Given that two-thirds of arable land is in the north while four-fifths of the water supplies are in the south, the planned water diversion project seems to be inevitable, especially with the location of the political center of gravity in Beijing.⁴¹ If experience is any guide, however, the water diversion projects can be expected to cause grave environmental damage. The notorious Three Gorges Dam is the leading contemporary example of the scale and seriousness of the environmental and cultural devastation that can result in the name of economic progress.⁴² As the largest engineering project in China since the Great Wall, the Three Gorges Dam is expected to displace more than one million people, obliterate countless cultural and historical artifacts, and cost approximately \$30 billion.⁴³ The dam also will put additional pressure on many endangered species, including the Yangtze sturgeon and alligator.⁴⁴

If there is a silver lining in the experience with the Three Gorges Dam project, it is that the sheer environmental audacity of the plan spurred significant political debate within the authoritarian political regime. In 1999, an unprecedented one-third of delegates at the central National People's Congress opposed further work on the dam.⁴⁵ Another likely outcome is that shoddy construction of the dam — or what premier Zhu Rongji has called “tofu construction” — may reveal the dark side of political corruption in state-owned enterprises in China.⁴⁶ The lesson may be catastrophic if adulterated construction materials result in a radical failure of the dam.

D. Deforestation and Desertification

Desertification has become an obvious, embarrassing, and detrimental

⁴⁰ *Id.*; Brown & Halweil, *supra* note 38.

⁴¹ Dorgan, *supra* note 31.

⁴² John Ridding, *Damned by Progress*, FIN. TIMES, May 2, 2002, at P1.

⁴³ *Id.*; Kari Huus, *The Yangtze's Collision Course: Where Nature Faces off with Industry and the Human Species*, MSNBC NEWS (Sept. 3, 1999), at <http://www.msnbc.com/news/307055.asp?cp1=1>. For a critique of the project, see *THE RIVER DRAGON HAS COME!: THE THREE GORGES DAM AND THE FATE OF CHINA'S YANGTZE RIVER AND ITS PEOPLE* (Dai Qing et al. eds., 1997).

⁴⁴ Gheleta, *supra* note 31, at 243.

⁴⁵ Ridding, *supra* note 42.

⁴⁶ *Id.*

environmental problem in China. Beijing has become infamous for increasingly frequent dust storms during the dry seasons. The source of these dust storms is neighboring Inner Mongolia, which is becoming a contemporary "dust bowl."⁴⁷ Total estimates are that 2,500 square kilometers of land per year becomes desert in China, including Inner Mongolia, Tibet, and elsewhere.⁴⁸ One of the largest regional dust storms ever recorded occurred in 2001.⁴⁹ According to a Chinese government survey in 1994, "China... had 1.69 million square kilometers of deserts, of which about two-thirds were natural deserts such as the Gobi (670,000 square kilometers) and one-third had been desertified by human activity."⁵⁰ About ninety percent of the deserts were located in the central and western provinces, including Gansu, Ningxia, Qinghai, Xinjiang and Inner Mongolia.⁵¹ Moreover, the rate of desertification is accelerating. According to a report in 1999 by a former environmental policy minister, Qu Geping, "an additional 900,000 square kilometers of Chinese territory show a clear 'tendency toward desertification.'"⁵² This area is greater than the combined size of California, Washington, and Oregon.⁵³

The harm caused by desertification to human subsistence activities, such as farming and raising livestock, goes without saying, but direct annual costs are estimated at \$6.5 billion.⁵⁴ Global climate change as well as poor anti-erosion practices are understood to be the primary contributing causes.⁵⁵ Overgrazing in particular is seen as one important root of the problem.⁵⁶

China adopted a new national statute to address the problem of desertification in 2001.⁵⁷ But its efficacy — including criminal penalties for violations and

⁴⁷ BROWN, *supra* note 14, at 66.

⁴⁸ U.S. Embassy Beijing, *China Adopts Law to Control Desertification*, at http://www.usembassy-china.org.cn/sandt/desertification_law.htm (last visited Sept. 17, 2002).

⁴⁹ BROWN, *supra* note 14, at 66.

⁵⁰ *China Adopts Law to Control Desertification*, *supra* note 48.

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.* Between 1994 and 1999, deserts in China grew by 20,280 square miles, an area equivalent to twice the size of Maryland. Frank Langfitt, *Driven by Weather, Waste, Deserts Swallowing China*, BALT. SUN, Apr. 20, 2002, at 1A. Over a quarter of the country is now desert. *Id.*

⁵⁴ *China Adopts Law to Control Desertification*, *supra* note 48.

⁵⁵ U.S. Embassy Beijing, *Grapes of Wrath in Inner Mongolia*, at <http://www.usembassy-china.org.cn/english/sandt/MongoliaDust-web.htm> (last visited Sept. 2, 2002).

⁵⁶ *Id.*

⁵⁷ *China Adopts Law to Control Desertification*, *supra* note 48. For a summary of key provisions translated from the statute, see *Highlights of PRC Desertification Law*, U.S. Embassy Beijing, at http://www.usembassy-china.org.cn/english/sandt/Highlights_of_PRC_Desertification_Law.htm (last visited Sept. 2, 2002). For a full translation of the law in English, see the EU-China Legal and Judicial Cooperation Program website at

interesting variations on the creation of rudimentary private property rights discussed below — remains to be shown.⁵⁸

Deforestation is another problem that has been rampant in China, so much so that logging has now been banned throughout the country.⁵⁹ Again, this problem has international implications because of a steady trade of raw timber that flows to China from the forests of Russia, Indonesia, Cambodia, and Vietnam.⁶⁰ One human consequence of massive human-caused deforestation in China has been an increase of destructive flooding. Yangtze River floods in the summer of 1998, for example, killed 3,656 people.⁶¹ Damages from the Yangtze flood were estimated at \$30 billion.⁶²

E. Biodiversity Loss

Related to massive deforestation and desertification as well as expansion of cities and industrial activity, China's economic growth has put great pressure on endangered species. It is well-known that we currently are living through an unprecedented destruction of other species in what E.O. Wilson has called the "sixth great extinction" in geological time.⁶³ An example of the nature of the problem appears in south central China's Huanduan mountains. Logging, collecting firewood, and other human economic activities threaten hundreds of bird and mammal species living in this area, including the giant panda (a symbol of environmentalism), the takin (a large goat-antelope), the forest musk deer, the white-lipped deer, and the snow leopard.⁶⁴ According to Friends of the Earth, China is "a leading offender in the illegal international trade in endangered species such as tigers and rhinos."⁶⁵ Although biodiversity losses are greatest in tropical

<http://www.lawinfochina.com> (last visited Sept. 12, 2002).

⁵⁸ *Id.*; see also *infra* text accompanying notes 97–102.

⁵⁹ *The Environmental Case Against PNTR for China*, Friends of the Earth, at <http://www.foe.org/international/wto/china.html> (last visited Aug. 29, 2002).

⁶⁰ *Id.*

⁶¹ BROWN, *supra* note 14, at 169.

⁶² *Id.*

⁶³ E.O. WILSON, *THE DIVERSITY OF LIFE* 343 (1992) ("The sixth great extinction spasm of geological time is upon us, grace of mankind. Earth has at last acquired a force that can break the crucible of biodiversity."). The earlier five great mass extinctions of species have been identified in the following periods: the Ordovician (440 million years ago), the Devonian (365 million years ago), the Permian (245 million years ago), the Triassic (210 million years ago), and the Cretaceous, which included the extinction of the dinosaurs (65 million years ago). *Id.* at 29.

⁶⁴ See *Hotspots: Mountains of South-Central China*, Conservation International, at http://www.conservation.org/xp/CIWEB/strategies/hotspots/central_china.xml (last visited Sept. 2, 2002).

⁶⁵ *The Environmental Case Against PNTR for China*, *supra* note 59.

countries with larger rainforests, China also bears a significant portion of responsibility for this global environmental problem.

F. Severe Air and Water Pollution (and Acid Rain)

Five of the world's ten most polluted cities are in China, and an estimated two million people die each year in China from air and water pollution.⁶⁶ Water pollutants are so potent that eighty percent of China's rivers have no fish remaining in them.⁶⁷ The Chinese government itself recognizes that water pollution in Chinese cities is "common and serious."⁶⁸ Air pollution levels in major Chinese cities are also severe and "among the highest on earth."⁶⁹ Airborne particulates in many cities are at two to five times the maximum concentrations recommended by the World Health Organization.⁷⁰ Death from respiratory diseases has become the second leading cause of death in China.⁷¹ Overall financial estimates of air and water pollution damage run as high as \$50 to \$100 billion per year.⁷²

Acid rain is another major problem in China. It adversely affects about thirty percent of China, predominantly in the southeastern part of the country.⁷³ Acid rain also poses significant regional threats through transnational pollution of Japan, Korea, and other neighbors.⁷⁴ China, according to one source, contributes to over half of the acid rainfall in Japan and eighty percent in South Korea.⁷⁵

⁶⁶ *Id.*; see also HERTSGAARD, *supra* note 7, at 5.

⁶⁷ Dorgan, *supra* note 31. A Chinese government official contested this statistic with me, but one problem is that reliable official data in China have been difficult to find.

⁶⁸ Alford & Shen, *supra* note 9, at 126 (quoting CHINA ENVIRONMENTAL YEARBOOK (1995)).

⁶⁹ Alford & Liebman, *supra* note 1, at 703.

⁷⁰ *Id.* at 703-04.

⁷¹ Alford & Shen, *supra* note 9, at 126.

⁷² *The Environmental Case Against PNTR for China*, *supra* note 59. Another study by the World Bank estimated costs of urban air and water pollution in China alone at more than \$32 billion in "premature deaths, morbidity, restricted activity, chronic bronchitis, and other health effects." Alford & Liebman, *supra* note 1, at 704.

⁷³ For official government statistics of the uneven geographical distribution of acid rain in China in 1999, see GEN. AFF. OFFICE OF CHINA, *Air Environment*, in REPORT ON THE STATE OF THE ENVIRONMENT IN CHINA 1999 (May 19, 2000), at <http://www.zhb.gov.cn/english/SOE/soechina1999/air/air.htm>; see also David G. Streets, *Energy and Acid Rain Projections for Northeast Asia*, NAUTILUS INST. (1997), available at <http://www.nautilus.org/papers/energy/streetsESENAY1.html>.

⁷⁴ Streets, *supra* note 73, at 1.

⁷⁵ HERTSGAARD, *supra* note 7, at 169.

G. Ozone Layer Depletion

Ozone layer depletion has continued despite the uncommon global regulatory response to the problem exhibited in the Montreal Protocol on Ozone Layer Depleting Substances, which has banned chlorofluorocarbons (CFCs) and other artificial chemicals harmful to the earth's ozone layer.⁷⁶ One major reason is that the treaty provides a ten-year lag time for developing countries to accede to the prohibitions, and some countries have taken advantage of this loophole to continue to manufacture and allow illicit export of CFCs and other ozone-depleting chemicals.⁷⁷ China, as well as India, for example, initially resisted acceding to the Montreal Protocol and insisted on technical and economic support from developing countries before doing so.⁷⁸ According to Friends of the Earth, China remains "the biggest producer" of CFCs.⁷⁹

H. Global Climate Change

China is also a major variable in the global climate change problem. "If current trends continue," again according to Friends of the Earth, "China will surpass the United States to be the largest emitter of greenhouse gases by approximately 2020."⁸⁰ China has been described accurately as "the sleeping giant" of climate change, though it also is correct to say that the giant is quickly awakening.⁸¹ By 1990, China had surpassed Russia to become the second leading country in greenhouse gas emissions.⁸² China's contribution to climate change is due primarily to rapidly increasing consumption of coal and oil to meet energy demands. According to another recent estimate, the percentage of China's emissions of carbon to the atmosphere will rise, if present trends continue, to forty percent of global emissions by 2020.⁸³ In other words, China's emissions alone "would likely undercut whatever progress is made by developed countries' emissions reductions"

⁷⁶ Jennifer S. Bales, *Transnational Responsibility and Recourse for Ozone Depletion*, 19 B.C. INT'L & COMP. L. REV. 259, 260-62, 274-76 (1996).

⁷⁷ *Id.* at 274, 285; Alford & Liebman, *supra* note 1, at 714.

⁷⁸ Bales, *supra* note 76, at 268. China and India refused to agree to the Montreal Protocol until they were granted financial assistance under its terms. *See, e.g.*, Harold K. Jacobson & Edith Brown Weiss, *Compliance with International Environmental Accords: Achievements and Strategies*, in INTERNATIONAL GOVERNANCE ON ENVIRONMENTAL ISSUES 78, 95 (Mats Rolén et al. eds., 1997).

⁷⁹ *The Environmental Case Against PNTR for China*, *supra* note 59.

⁸⁰ *Id.* Another source estimates the date as 2025. HERTSGAARD, *supra* note 7, at 170.

⁸¹ *See* Deborah E. Cooper, Note, *The Kyoto Protocol and China: Global Warming's Sleeping Giant*, 11 GEO. INT'L ENVTL. L. REV. 401 (1999).

⁸² *Id.* at 404; HERTSGAARD, *supra* note 7, at 169-70.

⁸³ Cooper, *supra* note 81, at 405.

under the Kyoto Protocol on Climate Change.⁸⁴

II. BUILDING THE RULE OF LAW IN CHINA

Given the massive array of environmental problems that confront China, one regulatory option that may be ruled out is “do[ing] nothing.”⁸⁵ As Ho Wai Chi, executive director of Greenpeace China, argues persuasively, “China cannot afford to get rich first and clean up later.”⁸⁶ If China does not take serious and effective steps to address its environmental problems, it will have “an environmental meltdown.”⁸⁷ The question then becomes not whether to regulate, but how. In other words, what regulatory strategies should China employ?

In order to adopt coherent regulatory solutions to environmental problems, it is important first to assess the general state of the legal system that one expects to use. In China, it is an unfortunate fact of history that some of the same experiences that have helped to create massive environmental problems also have contributed to the virtual destruction of the Chinese legal system. Both major environmental problems and institutional legal weakness are legacies of the Great Leap Forward and the Cultural Revolution.⁸⁸

Since Deng Xiaoping’s “opening,” however, the Chinese government has recognized the need to rebuild its legal infrastructure. I have assessed some recent milestones and continuing problems in rebuilding a “rule of law in China” elsewhere.⁸⁹ Suffice it to say here that if any additional arguments in favor of rebuilding a strong and autonomous legal system in China were needed, the cataclysmic environmental threats to the country would supply them in abundance. The accession of China to the World Trade Organization (WTO) is also expected to induce continued law reform toward, one hopes, the “uniform, impartial, and reasonable” legal system mandated by the WTO.⁹⁰

⁸⁴ *Id.*

⁸⁵ See Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 9.

⁸⁶ Huus, *supra* note 14.

⁸⁷ *Id.* (quoting Ho).

⁸⁸ For a recent account of the environmental destruction wreaked during Mao’s reign, see JUDITH SHAPIRO, *MAO’S WAR AGAINST NATURE: POLITICS AND THE ENVIRONMENT IN REVOLUTIONARY CHINA* (2001). For a summary review of the Maoist assault on lawyers, judges, law schools, and other aspects of the Chinese legal system, see Orts, *supra* note 9, at 57–59.

⁸⁹ See Orts, *supra* note 9. For another account including both empirical facts and theoretical assessments, see Randall Peerenboom, *Globalization, Path Dependency and the Limits of Law: Administrative Law Reform and Rule of Law in the People’s Republic of China*, 19 BERKELEY J. INT’L L. 161 (2001).

⁹⁰ Orts, *supra* note 9, at 45. For a generally optimistic account of the likely positive influence of WTO-accession on “the rule of law” in China and particularly environmental

In terms of assessing the adequacy of the current legal system in China for addressing environmental problems, one must conclude that, with a legal system being rebuilt almost from scratch, the technical burdens placed on it should not be severe. Judges are mostly untrained.⁹¹ Lawyers are not highly organized and do not have a strong independent sense of a "profession" separate from the authority of the political state.⁹² Therefore, before the legal system begins to regain ground, one should not expect too much of it.

At the same time, the magnitude of the environmental problems facing China should also help to spur legal development. In this respect, the coincidence of a broad recognition of the importance of environmental problems and the need for a strong legal system may yield creative potential for new regulatory strategies that other legal systems have not been able to consider.

III. ENVIRONMENTAL LAW WITH CHINESE CHARACTERISTICS

When thinking about how environmental law may best develop in China, it is important to recall that a number of different options are available when deciding how to address particular environmental problems. One characterization of the different types of environmental regulation may be given as follows.

Private rights. This regulatory approach has a long pedigree. It focuses on judicial enforcement of privately held rights to own property, enter into contracts, and be protected from wrongful harm to one's property or bodily integrity through the law of torts and nuisance.

Command-and-control regulation. This traditional approach to environmental law relies on the administrative enforcement of technology-based or performance-based standards for environmental performance. The performance standards usually are specific and defined either by statute or administrative regulation. They most often are enforced through a system of permits or an enforced disclosure regime backed up with periodic inspections.

law, see Richard J. Ferris, Jr. & Hongjun Zhang, *The Challenges of Reforming an Environmental Legal Culture: Assessing the Status Quo and Looking at Post-WTO Admission Challenges for the People's Republic of China*, 14 GEO. INT'L ENV'T'L. L. Rev. 429 (2002). But see Peerenboom, *supra* note 89, at 170-71 (noting that many supporters of China's entrance to the WTO look forward to progress in law reform and promoting values and practices of the rule of law, but these changes may prove true only in the long run after some initial high expectations are dashed).

⁹¹ Orts, *supra* note 9, at 65; see also Alford & Shen, *supra* note 9, at 142 (noting that "many Chinese judges still do not hold degrees in law").

⁹² Orts, *supra* note 9, at 65-66, 72-73; see also Alford & Shen, *supra* note 9, at 142 (observing that "concepts of judicial independence and professional identity that help judges in liberal democratic states shield their deliberations from the undue influence of local political authorities and private power alike remain contested").

Market-based variations of command-and-control. These approaches attempt to harness market forces either to make command-and-control technology more efficient and effective (such as through the issuance and trading of pollution permit allowances) or to estimate and “internalize” the harmful environmental externalities by imposing environmental charges, fees, or taxes on activities that produce these externalities.

Voluntary regulation. These programs are encouraged by government agencies and amount essentially to coordinated altruism, given their non-binding character. Informal incentives may sometimes be provided for participation, such as implicit expectations of beneficial regulatory treatment or reputational gains.

Reflexive regulation. This relatively new form of regulation relies on indirect methods of government-encouraged or mandated environmental management, auditing, and reporting systems. The aim is to institutionalize environmental decision making processes in the everyday operations and planning of business enterprises.⁹³

Informational regulation. Also indirect, this regulatory strategy relies on government-encouraged or mandated public disclosure of environmental performance data. The idea is that disclosure of information will produce public and market pressure to improve environmental performance.⁹⁴

Environmental contracts. This regulatory approach, which is more commonly used in Europe and Japan than in the United States, employs government-organized agreements among various interests to address particular environmental problems through collective action and monitoring.⁹⁵ Agreement can occur at either the “micro” or “macro” regulatory level.⁹⁶ “Micro” environmental contracts concern particular bargaining and specific agreements made between a regulated entity and an administrative authority. “Macro” environmental contracts refer to negotiations

⁹³ For my account of this kind of environmental law, see Eric W. Orts, *Reflexive Environmental Law*, 89 NW. U.L. REV. 1227 (1995); see also Richard B. Stewart, *A New Generation of Environmental Law?*, 29 CAP. U. L. REV. 21, 130–34 (2001). A focus on “management-based environmental policy” comports with what I’ve called a reflexive approach. See Cary Coglianese & Jennifer Nash, *Toward a Management-Based Environmental Policy?*, in REGULATING FROM THE INSIDE: CAN ENVIRONMENTAL MANAGEMENT SYSTEMS ACHIEVE REGULATORY GOALS? 222 (Cary Coglianese & Jennifer Nash eds., 2001).

⁹⁴ See Paul R. Kleindorfer & Eric W. Orts, *Informational Regulation of Environmental Risks*, 18 RISK ANALYSIS 155 (1998); see also Stewart, *supra* note 93, at 134–43 (describing “information strategies” of regulation as a kind of reflexive environmental law).

⁹⁵ For a collection of essays on this topic, see ENVIRONMENTAL CONTRACTS: COMPARATIVE APPROACHES TO REGULATORY INNOVATION IN THE UNITED STATES AND EUROPE (Eric W. Orts & Kurt Deketelaere eds., 2001); see also Stewart, *supra* note 93, at 60–94.

⁹⁶ This distinction is nicely made and described by Stewart, *supra* note 93, at 60, 63–64, 80–81.

for large scale regulation of industries or business sectors.

For China, given its environmental problems and legal system, and considering the above menu of options that may be selected to address different problems, I tentatively suggest that regulatory initiatives should focus on the following set of choices.

1. *Encourage the legal recognition and enforcement of private rights of property, torts, nuisance, and contracts.*

Especially for a legal system in development, it is important to recall that individual enforcement of basic legal rights to private property, contracts, and freedom from wrongful bodily harm have been fundamental in environmental regulation throughout history.⁹⁷ As the Chinese legal system develops, recognition of the importance of these kinds of rights in environmental protection may provide a mutually reinforcing dynamic. Solving environmental problems by strengthening the legal protection of basic rights reinforces the legal system, and a stronger legal system is better able to protect and enforce legal rights effectively.⁹⁸ In other words, strengthening the Chinese legal system, including citizen access to it, can potentially create a "virtuous circle" with respect to public pressure and monitoring for environmental protection.⁹⁹ Loosening traditional restrictions in Chinese law on "standing" for citizens and other legal entities to sue in court also will be important to this connection.¹⁰⁰

Examples of a private legal rights approach to environmental protection appear in China. The desertification law adopted on August 31, 2001, specifically provides for the granting of property rights to people who contribute to preserving land.¹⁰¹ Under the national law, local governments are given the authority to grant land-use contracts to citizens who pledge to restore land for up to seventy years — not quite fee simple private ownership, but better than most present thirty-year land-use contracts available in China.¹⁰² Reports of common people resorting to the law to fight against pollution also are increasing. In December 2001, for example, a group of 100 peasants won a verdict for the equivalent of \$676,600 against a paper factory for injuries caused by the dumping of toxic chemicals into a river.¹⁰³ One Chinese environmental activist, Liang Congjie, describes change in China on environmental

⁹⁷ Even before "environmental law" grew into a field of its own, basic legal protections in the law of property, contracts, and torts were often concerned with "environmental" kinds of problems.

⁹⁸ See Alford & Shen, *supra* note 9, at 147.

⁹⁹ See *id.*

¹⁰⁰ See *id.*

¹⁰¹ *China Adopts Law to Control Desertification*, *supra* note 48.

¹⁰² *Id.*

¹⁰³ Tamora Vidaillet, *Chinese Turn to Law to Right Pollution Wrongs*, REUTERS, May 2, 2002, available at <http://www.planetark.org/avantgo/dailynewsstory.cfm?newsid=14368>. I thank Bill Weil for calling my attention to this source.

issues as an uphill battle, but observes optimistically that “[s]ome people have started to think it is possible to try and protect themselves with the law.”¹⁰⁴

2. *Enhance basic administrative capacity for command-and-control regulation.*

In addition to generally focusing on building the legal system through training new lawyers and judges, China should continue to strengthen its basic administrative bureaucracy with responsibility for environmental law. Recent years have witnessed improvements in this field. The first national administrative body with responsibility for environmental matters in China was the Environmental Protection Bureau created in 1975.¹⁰⁵ It was replaced by the establishment of the National Environmental Protection Commission in 1988, which in turn was upgraded into the National Environmental Policy Agency (NEPA) in 1992.¹⁰⁶ The NEPA had sub-ministry status and reported directly to top lawmaking authorities.¹⁰⁷ In 1998, NEPA was again renamed the State Environmental Protection Administration (SEPA) and given the rank of a full ministry.¹⁰⁸ SEPA now has approximately 200 staff at the national level, which though tiny in comparison with the size of China, represents a gradual improvement in administrative capacity.¹⁰⁹ This progress in building administrative capacity must continue if the Chinese government is to have any hope of grappling seriously with the environmental problems detailed above.

Environmental statutes and regulations themselves also need to be strengthened and clarified. Vagueness has been a major weakness with Chinese legislation in the past. An early statute addressing air pollution, for example, simply exhorted government officials to protect human health against air pollution in the interests of “socialist modernization.”¹¹⁰ More recently, debate about balancing environmental protection and economic development has occurred in the process of adopting new air pollution regulation. Legislative debate eventually resulted in the passage in 1995 of a relatively detailed statute that addressed clean production technology, coal washing, acid rain controls, and a phase-out of leaded gasoline.¹¹¹ Environmentalists did not get all or even most of what they desired in the new legislation, but the experience showed that political pressure was beginning to produce tangible legal results.¹¹² Moreover, revisions of the air pollution statute in 2000 included a number of key provisions urged by environmentalists. In addition to encouraging “sustainable development” and the increased use of renewable

¹⁰⁴ *Id.*

¹⁰⁵ Alford & Liebman, *supra* note 1, at 709.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ Alford & Liebman, *supra* note 1, at 711–12.

¹¹¹ *Id.* at 725–26.

¹¹² *Id.*

energy, the statute authorizes major cities to exert greater authority in environmental matters (including bans on certain activities), provides incentives for increased use of natural gas and reduced use of coal, imposes environmental technology standards on automobiles, and increases sanctions for legal violations.¹¹³ Recently, as part of a campaign intended to demonstrate renewed seriousness of purpose in addressing environmental issues, the government shut down 823 businesses for violating pollution laws.¹¹⁴ The new air pollution statute will by no means solve all of China's environmental problems — even with respect to urban air pollution and acid rain — but it demonstrates an increase in the political will of the central government to seriously address environmental problems through legal reform. It is a hopeful sign for the future in an otherwise dark landscape.

3. *Recognize, encourage, and protect NGOs as well as government-organized NGOs (GONGOs).*

Another important area needing improvement in Chinese environmental law relates to the need for continued public pressure for change and, in particular, for legally recognizing a legitimate role of NGOs. In China, the role of “nongovernmental” organizations is complicated by the strong “governmental” history of the country.¹¹⁵ NGOs traditionally have been strictly prohibited in China, and even today NGOs that are deemed by the government to harbor dissidents (such as democracy advocates) or otherwise to threaten the authority of the state are proscribed.¹¹⁶ Legitimate NGOs fall into three remaining categories: (1) Communist Party-sponsored “mass organizations” (*qunzhong zuzhi*) that play an overtly political and official role; (2) officially recognized “social organizations” (*shehui tuanti*), “popular organizations” (*minjian tuanti*), or “nongovernmental organizations” (*feizhengfu zuzhi*) that include “business groups, professional associations, cultural clubs, and academic societies;” and (3) unofficial groups that do not qualify for government recognition.¹¹⁷ The focus for legal reform recommended here would be on the secondary level of officially recognized nongovernmental organizations, that is, NGOs that are given government recognition, but are not themselves “government-organized nongovernmental organizations” (“GONGOs”).¹¹⁸

If anything seems clear from the history of environmental movements in Western societies, it may be that true social pressure for environmental protection requires a vibrant civil society. Citizens actively engaged in promoting

¹¹³ *Id.* at 735.

¹¹⁴ *China Closes Down 823 Polluting Businesses*, ASSOCIATED PRESS (July 12, 2002), available at http://enn.com/news/wire-stories/2002/07/07122002/ap_47847.asp.

¹¹⁵ See generally C. David Lee, *Legal Reform in China: A Role for Nongovernmental Organizations*, 25 YALE J. INT'L L. 363, 374 (2000).

¹¹⁶ *Id.* at 376.

¹¹⁷ *Id.*

¹¹⁸ *Id.*

environmental issues may have some influence individually, but they also must have the ability and political right to organize into larger groups to affect official policy. This principle applies no less to China than elsewhere.¹¹⁹ Perhaps especially in China, with its far-reaching expanse and large population, NGOs are necessary in order to increase environmental awareness as well as to serve as focal points for environmental activism.

At the moment, Chinese society is relatively undeveloped along these lines. As some scholars observe, the need for government approval means that "there is 'virtually no such thing' as a completely nongovernmental institution" in China.¹²⁰ Nevertheless, there are an increasing number of officially registered NGOs in China as well as an increasing number of unofficial NGOs. In 1998, there were approximately 200,000 officially recognized NGOs as well as 800,000 unofficial NGOs.¹²¹ Many of these represent environmental groups and interests. As China's legal system develops along with the growth of at least semi-autonomous NGOs, the environmental NGOs can help improve environmental conditions in China not only through the traditional NGO role of political lobbyist, advisor, or activist, but also through subsidiary roles of educators and regulatory watchdogs.¹²²

The development of active NGOs in China also is needed because of the correspondence between a lack of democratic government and the exponential growth of new business enterprises. As the government has "freed" business enterprise to develop the economy, the state also should "free" society to organize in a manner that allows for a moderation of the interests of the new business elite. Even if China does not develop a more democratic central government, it should adopt measures to balance the pluralistic developments of business organizations with developments of independent NGOs to express other important social interests, including environmental perspectives.

4. *Enter into international agreements with other nation-states, NGOs, and private businesses to address regional and global issues.*

A last recommendation is to emphasize the fact that many environmental dilemmas in China are regional and global in scope. China cannot address these problems alone. It does not have sufficient resources, and the consequences of China attempting to solve its environmental problems without outside assistance would be disastrous. Other countries and citizens may balk at helping China in this respect, but China's accession to the World Trade Organization (WTO) as well as China's increasing integration in the global economy regardless of the WTO, show

¹¹⁹ See Ferris & Zhang, *supra* note 90, at 450–51 (emphasizing the need to legally recognize and encourage environmental NGOs in China).

¹²⁰ *Id.* at 379 (quoting *Beyond "Linkage" and "Engagement": A New Approach to U.S. China Policy* at <http://www.lchr.org/hongkong/chinapol98.htm> (last visited Feb. 2, 1999)).

¹²¹ Lee, *supra* note 115, at 377 n.63.

¹²² See *id.* at 382 (outlining some of these roles of NGOs in China).

that a unilateral approach to current environmental problems is unlikely to prove sufficient. Particularly with respect to problems such as global climate change, China is a key factor and necessary party at the table if any solution is to be reached.¹²³ A number of other large environmental problems itemized above — including acid rain, ozone layer depletion, and biodiversity loss — are part of a general global phenomenon.¹²⁴ The impending environmental disasters in China are of global scope. Although the Rio + 10 conference in Johannesburg, in September 2002, seems to have missed an opportunity for global leaders to unite behind a common environmental agenda, a global approach to environmental problems in China is obviously needed.¹²⁵

Short of new international agreements among nation-states, international NGOs also have a major role to play in China. Here, one may be more optimistic. International environmental NGOs are playing a larger and more important role in recent years in international environmental law and policy. "The expanding role of science in defining environmental problems," as one commentator has observed, "is changing the politics of environmental priority setting and enforcement by increasing the influence of NGOs."¹²⁶ Large NGOs have become "permanent players in the regulatory game with the capacity to influence all phases of policy."¹²⁷

International NGOs may also act outside of their traditional role of official policy making. Recently, for example, the World Resources Institute inaugurated

¹²³ See *supra* text accompanying notes 80–84.

¹²⁴ See *supra* text accompanying notes 63–65, 73–84.

¹²⁵ In the United States, the Johannesburg Earth Summit was overshadowed by the preoccupation of the Bush Administration with saber-rattling against Iraq. Developing countries and environmentalists cited President Bush's absence as proof of a general lack of public concern for global issues of environmental sustainability. See, e.g., Chris Clarke, *Earth Summit Falls Flat: NGOs Shut Out, Colin Powell Is Booed Offstage, and a Mediocre Time Is Had By All*, 4 EARTH ISLAND J. 29 (2002); Editorial, *Hope for the Future*, S. CHINA MORNING POST, Sept. 6, 2002, at 19. Although some observers noted "missed opportunities," a bright spot was the creation of "[h]undreds of new partnership among governments, businesses, and civil-society organizations." Kurt Shillinger, *Powell Heckled at Global Summer Defends U.S. Record on Aiding the Poor, the Environment*, BOSTON GLOBE, Sept. 5, 2002, at A10; see also *The Bubble-and-Squeak Summit*, ECONOMIST, Sept. 5, 2002 (noting that though some government observers were "unimpressed" with the results of the Johannesburg discussions, the formation of "public-private partnerships" may have "a useful impact" in the future); Barry James, *Summit Ends in Broad Pledge on World Goals; Many Ecologists Protest "Compromises" in Accord Targeting Rich-Poor Divide*, INT'L HERALD TRIB., Sept. 6, 2002 (noting that though the summit "left environmental groups unhappy," Kofi Annan of the U.N. lauded "an impressive range of concrete policies and actions").

¹²⁶ A. Dan Tarlock, *The Role of Non-Governmental Organizations in the Development of International Environmental Law*, 68 CHI.-KENT L. REV. 61, 63 (1992).

¹²⁷ *Id.*

a series of conferences on business, education, learning, and leadership in China with the aim of encouraging the teaching of material on environmental management and sustainable development in Chinese business schools.¹²⁸ One might describe these efforts as a kind of NGO “reflexive” strategy of environmental reform, though no specific laws are adopted.¹²⁹

A number of large environmental NGOs also have entered into agreements to preserve significant expanses of land and its accompanying biodiversity in China.¹³⁰ For example, World Wildlife Fund (WWF) has been closely involved in training rangers and other staff working in the Wanglang Nature Preserve in Pingwu County, Sichuan Province.¹³¹ Among others, endangered species in this preserve include the giant panda.¹³² WWF also is working to develop an ecotourism industry in the area to replace lost income from a ban on logging.¹³³ Another major preservation effort in China is sponsored by the Nature Conservancy in Yunnan Province.¹³⁴ The Nature Conservancy partnered with the Chinese government “to join in the creation of an integrated conservation and economic-development project.”¹³⁵ A key aspect of the strategy to date has been the development and promotion of “biogas” stoves as a substitute for local wood gathering and burning practices that are environmentally harmful.¹³⁶

Private businesses from other countries may also have an important role to play in China’s environmental as well as economic development. Automobile companies, for example, might consider a leapfrog approach to technology and consider China as a potential platform for the use of new non-petroleum-based fuels.¹³⁷ Other opportunities may appear in sponsorship of the Beijing Olympics (and its related environmental clean-up) and other areas. For example, China presently recycles only 27 percent of its paper, compared with 46 percent in the

¹²⁸ See *Sustainable Enterprise Program (SEP)*, World Resources Institute, at <http://www.wri.org/meb/chinabell2.html> (last updated Oct. 22, 2001).

¹²⁹ See *supra* note 93 and accompanying text.

¹³⁰ For a useful overview of Chinese law aiming to protect biodiversity, see Lawrence Watters & Wang Xi, *The Protection of Wildlife and Endangered Species in China*, 14 GEO. INT’L ENVTL. L. REV. 489 (2002).

¹³¹ Panda Conservation in Wanglang Nature Reserve, World Wildlife Fund, at http://www.worldwildlife.org/pandas/wwf_do_3a.htm (last visited Sept. 17, 2002).

¹³² *Id.*

¹³³ *Id.*

¹³⁴ See The Nature Conservancy, Greater China Program, at <http://nature.org/wherewework/asiapacific/china/> (last visited Sept. 17, 2002).

¹³⁵ *Id.*

¹³⁶ Ron Geatz, *High Energy on the Edge of the Himalayas*, NATURE CONSERVANCY Summer 2002, at 28.

¹³⁷ This idea was raised and discussed in informal conversations at the World Resources Institute’s BELL conference at the Bren School. See *supra* note *.

U.S., 53 percent in Japan, 66 percent in South Korea, and 72 percent in Germany.¹³⁸ Some business opportunities as well as risks may lie along the road toward the potential "greening" of China.

CONCLUSION: BIG DRAGON OR BLACK DRAGON?

This Article has attempted to provide an overview of the environmental challenges that China faces, as well as to make several recommendations about how an "environmental law with Chinese characteristics" might develop to address them. I have given only a general outline of the major problems and suggested possible directions for solutions, but perhaps further experiments along these lines may prove beneficial.

Risks on the road to reform, however, are present. Some of the leading risks include the lack of sufficient enforcement, inadequate legal infrastructure, and a possible inability to sustain policies.

Too many laws; too little enforcement. China has begun to rebuild its legal system, and part of this process has been to pass a great number of new statutes. If these laws are wisely considered and interpreted, they will have positive effects. There is, however, the danger of having too many statutes and not enough wisdom. As a Chinese proverb holds, "The more laws are promulgated, the greater the number of thieves."¹³⁹ Passing statutes is not a substitute for devoting resources to capacity-building in terms of the personnel and institutions needed for a "rule of law" to develop in China. A similar risk may appear in a Chinese tendency to criminalize conduct rather than to focus on systemic changes.¹⁴⁰

Legal transplants without similar legal infrastructure. Another major risk in building environmental law in China is that inexperienced bureaucrats will look too quickly or too easily to foreign models of regulation. Other fields of law have shown a dangerous tendency in this respect. One notorious example is the failure of American academic recommended corporate law in Russia.¹⁴¹ An example in environmental law might be recommending sophisticated market-based permit trading schemes to address some Chinese environmental problems. Without an adequately developed administrative regime, sophisticated market-based trading

¹³⁸ BROWN, *supra* note 14, at 178-79 (2001).

¹³⁹ H. PATRICK GLENN, *LEGAL TRADITIONS OF THE WORLD* 293 (2000).

¹⁴⁰ For a discussion of criminal penalties for environmental violations in China, see Yang Chun-xi et al., *China's Treatment of Crimes Against the Environment: Using Criminal Sanctions to Fight Environmental Degradation in the PRC*, 8 J. CHINESE L. 145 (1994).

¹⁴¹ Compare Bernard Black & Reinier Kraakman, *A Self-Enforcing Model of Corporate Law*, 109 HARV. L. REV. 1911 (1996) (describing recommended model for corporate law actually adopted by the Russian government), with Bernard Black et al., *Russian Privatization and Corporate Governance: What Went Wrong?*, 52 STAN. L. REV. 1731 (2000) (admitting some major problems with the recommended approach).

mechanisms are unlikely to work. At the same time, some relatively simple market-based mechanisms, such as increasing charges on the use of coal, may be relatively easy to administer, though at the additional risk of misuse by the government entity that benefits from the charges.¹⁴² Nevertheless, a fee-based approach to some problems in China, such as massive water shortages, may make sense.

Economic development without sustainable policies. The most serious risk remains the most obvious and difficult one. Economic development in China has provided a measure of public legitimacy to the government, and the adoption of sustainable policies may be seen by some to impede this development in the short run. If opponents of change are successful, however, the stage will be set — as it is today — for an environmental as well as an economic catastrophe in China. Rather than the “big dragon” of economic power that some have argued to describe China’s future,¹⁴³ there is also the significant risk of an environmental collapse that would make of China a “black dragon.”¹⁴⁴

Optimism that China will evolve into a big, green dragon may depend mostly on NGOs, business enterprises, and the efforts of other individuals rather than on the actions and policies of nation-states. As Simon SC Tay suggests in a recent evaluation of the terrible southeast Asian fires in the late 1990s, in which established political organizations of nation-states receive poor marks, “private actors have the potential to advance the level of environmental protection, either by supplementing government action or in lieu of it.”¹⁴⁵ The environmental future of China lies in the hands not only of government officials and a new generation of regulators, but many other individuals, businesses, and nongovernmental organizations who have economic stakes, political interests, and moral values involved in the unfolding story of how China develops.

¹⁴² See, e.g., Stewart, *supra* note 93 at 112–13 (noting that environmental charges or fees have been used in China in part as a mechanism to raise revenues for local government, rather than as a policy tool).

¹⁴³ See DANIEL BURSTEIN & ARNE DE KEIJZER, *BIG DRAGON: CHINA’S FUTURE: WHAT IT MEANS FOR BUSINESS, THE ECONOMY, AND THE GLOBAL ORDER* (1998).

¹⁴⁴ For an argument along different lines indicating that China is headed for a collapse due to social problems, see GORDON G. CHANG, *THE COMING COLLAPSE OF CHINA* (2001).

¹⁴⁵ Simon SC Tay, *Southeast Asian Fires: The Challenge for International Environmental Law and Sustainable Development*, 11 GEO. INT’L ENVTL. L. REV. 241, 243–44 (1999).