

Surviving an Environmental Crisis: Can China Adapt?

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A STRIKING COROLLARY TO CHINA'S recent economic rise has been its equally dramatic environmental decline. China is now home to some of the most polluted cities in the world—up to 70 percent of its rivers and lakes are seriously polluted, and ecological degradation is widespread. As the world's largest producer and consumer of coal, China contributes significantly to global warming. It is predicted to overtake the United States as the world's largest contributor to greenhouse gas emissions by 2025. The scale and severity of environmental problems in China has raised concerns over the sustainability of its rapid economic growth. Commentators warn of impending economic collapse, rising social conflicts, and large-scale public health disasters. Not only is China's drive for modernization at stake, but the global environment is too.

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A decade ago, warnings of the likely environmental consequences of China's pattern of economic growth appeared overly alarmist.¹ But today, as cities across China develop at breakneck speed despite a fragile ecology and scarce natural resources, such forecasts can no longer be so easily dismissed. Nevertheless, predictions must take into account the potential for change. Above all, in assessing the domestic and international implications of China's environmental crisis, a critical question needs to be addressed: can China adapt?

This article will begin with an overview of China's contemporary environmental problems and their spillover effects beyond territorial boundaries. Reflecting back upon the past decade, it will consider key changes in the central government's response to environmental concerns. This article will also identify some of the major constraints on implementing reforms, with a particular emphasis on the lack of openness within

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the Chinese decision-making process. Moving beyond purely domestic concerns, it will discuss China's participation in global environmental governance. What becomes clear is that solutions to China's environmental crisis do not lie simply in more effective domestic reform, but also in higher levels of international and regional cooperation in which China should take a leading role.

ENVIRONMENTAL CRISIS IN THE MAKING

China's environmental crisis has a long history. Since ancient times, China has been extracting natural resources in the pursuit of military power and excessively cultivating land, placing a significant burden on the natural environment.² During the Maoist period, the quest to conquer nature in the pursuit of a socialist utopia had particularly devastating environmental and human consequences. For example, mass efforts to increase crop yields and steel production during the Great Leap Forward (1958–1961) led to the destruction of millions of hectares of forests as well as the greatest recorded famine in history.³

Since the onset of economic reforms in the late 1970s, rapid economic growth combined with population pressure and unsustainable production practices have further accelerated China's environmental decline. According to official statistics, 90 percent of China's grasslands have become degraded, and desertification now covers one third of China's land base.⁴ In addition, almost 40 percent of the nation suffers from soil erosion as deforestation and unsustainable farming practices cause 10,000 square kilometers of lost soil per annum. The sediment discharge from soil erosion is filling up rivers and lakes, contributing to more frequent flooding. Moreover, increasing soil erosion and desertification in northern China is directly affecting the nation's capital—in 2000 alone, Beijing experienced 11 dust storms.⁵

Forest resources are scarce (18 percent of the total land area) and wetlands have been reduced by 60 percent. Although exact figures are not available, the loss of biodiversity is also a major concern. Of the 640 species listed under the United Nations Convention on International Trade in Endangered Species of Wild Fauna and Flora, it is estimated that approximately 156 are in China.⁶

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For a country undergoing rapid urbanization, water scarcity poses a significant challenge. China's per capita water use is only a quarter of the world average. Moreover, water resources are unevenly distributed. Simply put, the areas south of the Yangtze River have 80 percent of the nation's water resources but lack land, while the reverse situation exists in the north of China. Most of the water supply to major cities depends on ground water pumped from aquifers that are drying up or becoming depleted due

to salinization.⁷

Rising pollution is exacerbating China's water problems. More than half of the monitored urban river sections in northern China do not meet the lowest ambient standard (grade 5)—the water is officially classified as unfit even for irrigation. The industrial discharge of toxic substances such as mercury, phenol, chromium, and cyanide together with untreated municipal wastewater and fertilizer runoff are largely to blame. Despite efforts to enforce regulatory controls, an estimated 300 million people still do not have access to clean water.⁸

Air pollution is also reaching record levels. Sulfur dioxide (SO₂) emissions in China are now among the highest in the world—in many cities exceeding World Health Organization recommendations by two to five times.⁹ SO₂ pollution is a precursor of acid rain, which now covers roughly 30 percent of total land area. It is a particular problem in the south-central and southeastern regions of China where the average pH value of precipitation is often 4 or even 3 (a pH level below 5 indicates acid rain; a 4 or 3 is equivalent to vinegar). More recently, in major cities such as Shanghai, Beijing, and Guangzhou, nitrogen oxide (NO_x) emissions have risen dramatically. These cities are now experiencing Los Angeles-style photochemical smog as a result of heavy traffic pollution. Between 2000 and 2005, the number of cars on the roads in Beijing doubled to 2.6 million. This figure is expected to increase to 3.5 million by 2008 when the city hosts the Olympic Games.¹⁰

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TRAGEDY BEYOND THE BORDER

The magnitude of China's environmental crisis singles it out for international attention. Of particular concern is the rising trend in emissions of carbon dioxide (CO₂), the most prevalent of greenhouse gases. China's contribution to global CO₂ emissions from fossil fuel combustion rose from 11 percent in 1989 to 15 percent in 2005. It is now ranked second behind the United States, which contributes 25 percent of the world's total CO₂ emissions. However, per capita emissions are still relatively low: in 2005 China emitted 3.9 tons of CO₂ per capita compared with 25.6 tons in Australia and 24.5 tons in the United States.¹¹

It is worth mentioning here that China not only contributes to global warming but is also affected by it. According to a recent report by the Chinese Academy of Sciences, the glaciers on the Qinghai-Tibetan plateau are shrinking by seven percent annually.¹² If this trend continues, it will lead to further desertification of the grasslands as well as severe water shortages. The glaciers regulate the water supply for the Yellow, Yangtze, Mekong, and other major rivers of South and Southeast Asia. Higher temperatures will increase flooding in the rainy season and reduce water in the dry season, thus affecting

food production in the provinces downstream.¹³

A second area of concern at the international level relates to resource security. China's demand for resources is beginning to have a major impact on world markets. The country is now the world's largest consumer of timber and the second largest consumer of oil (in 2004 it accounted for almost 40 percent of global demand).¹⁴ Despite a traditional emphasis on food security, China is also becoming a major importer of grain. Between 1998 and 2004, grain production in China dropped by 50 million tons. To provide a sense of perspective, this is more than the total grain harvest in Canada, a leading exporter of grain.¹⁵ Bearing in mind that China and India constitute 40 percent of the world's population, a key question is the extent to which per capita resource consumption at levels found in industrialized states can be sustained on a global scale.

Of more immediate concern are the cross-border environmental implications of China's rapid development. For example, it is widely known that the cascade of dams built on the Mekong River in Yunnan province pose serious risks for countries downstream.¹⁶ Equally worrisome is Chinese loggers' destruction of Burma's northern frontier forests. Following a logging ban imposed by China's central government in 1998, the importation of illegal logs from across the China-Burma border has increased exponentially to meet timber demand.¹⁷

66 Whether China is in fact experiencing an environmental crisis is no longer a matter for debate. Instead, the important question is how this crisis will affect China's future development trajectory as well as its relations with the outside world. Much depends on the extent to which the Chinese government is capable of responding to the crisis. Does a strong political commitment exist? What are the barriers to implementing environmental reforms? And what more needs to be done at the international level?

THE RESPONSE OF THE CHINESE GOVERNMENT 1996-2006¹⁸

Environmental issues remained low on the Chinese political agenda throughout the 1980s and early 1990s. As in other industrializing states, pollution and other forms of environmental degradation were seen as an inevitable consequence of progress. Although some environmental laws and regulations were introduced, they were completely overshadowed by economic imperatives. Overall, China's pro-growth development strategy was predicated on the assumption that rising incomes would inevitably lead to rising environmental concern. At the international level, the Chinese government's resistance to environmental protection reflected concern that richer nations used environmentalism as a pretext for controlling the economic competitiveness of rapidly industrializing states. High moral principles were also at stake. At the time of the United Nations Conference on Environment and Development (UNCED) in 1992, the Chinese government

strongly endorsed the principle of historic responsibility for environmental clean-up, placing the blame firmly on the shoulders of the richer, industrialized states. In reinforcing the idea that development must come first, Dr. Song Jian, the Chinese spokesperson for environmental affairs, stated that "one should not give up eating for fear of smoking."¹⁹

Eventually, safeguarding the environment became a *jiben guocce* (fundamental state policy) in 1993, opening the way for rapid expansion of environmental laws and regulations. A few years later in July

1996, the first appearance of a Chinese president, Jiang Zemin, at the Fourth National Conference on Environmental Protection signalled an important turning point in government thinking. Instead of pursuing the familiar line of "pollute first, clean up later," the General Secretary made the following statement:

Some comrades ignore the work of environmental protection. They believe that it is most important to develop the economy and environmental protection can be put aside at the moment . . . [M]any economically developed countries took the same approach of serious waste of resources and "treatment after pollution," thus causing grave damage to the resources and ecological environment of the world. This is a serious lesson drawn from the developed world. We should never take such an approach.²⁰

Over the past decade, the Chinese government has expressed a growing commitment to environmental protection: the regulatory and legal frameworks have expanded with a stronger emphasis on ecological protection as well as pollution control, environmental priorities have been fully integrated into the state Five-Year Plans for development, and investment in environmental protection as a percentage of GNP has risen from 0.69 percent during the seventh Five-Year Plan (1986–1990) to a pledged 1.5 percent for the tenth Five-Year Plan (2001–2005).

Beyond these measures it is possible to identify four significant, central policy changes. First, a greater understanding of the costs of environmental degradation has helped increase government awareness that prevention is better than cure. For example, it is now clear to many policymakers that the costs of industrial retrofitting far outweigh the costs of investing in cleaner production techniques, and that effective watershed management aimed at protecting reservoirs against siltation and floods is far cheaper than the rehabilitation of an eroded watershed. The central government is now actively promoting cleaner production methods in Chinese factories, and major cities have

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imposed strict vehicle emissions standards.²¹ Following the devastating floods in 1998 that led to an official death toll of 3,000 and cost around \$20 billion, the government is also investing heavily in reforestation programs.²² According to official estimates, by the end of 2003 almost 80,000 square kilometers of cropland had been reforested or reverted back to grassland.²³

A second major change in central policy has coincided with the shift toward a market-based economy. Command and control measures are no longer seen as the only means of protecting the environment. Since the late 1990s the government has been experimenting with a number of economic incentive schemes. For example, market-based taxes (modified to 50 percent) and a quota system for regulating SO₂ emissions have been set up in some cities. The government has also developed an environmentally safe labeling scheme as a means of pushing environmental reform on the basis of consumer choice. More recently, proposals have been put forward to place a monetary value on scarce resources such as water and coal. There has even been some discussion of using a green GDP indicator to ensure that economic growth statistics reflect environmental externalities.

Based upon the same market logic, it is also understood that promoting energy efficiency is the cheapest way to reduce pollution costs with the additional benefit of reducing energy demand. Corporations are increasingly taking the lead. The state-owned Shenhua Group, for example, has recently announced plans to build the world's first commercial direct coal-liquefaction plant in Inner Mongolia.²⁴ Even more impressive is the plan to build whole eco-cities—such as Dongtan on Chongming Island outside Shanghai—that will recycle up to 80 percent of their solid waste and generate all their energy needs from renewable sources.²⁵

Third, citizen participation is an increasingly important driver of effective environmental management. New forms of “electronic government” have provided a virtual means of sourcing ideas for environmental improvement. The Chinese print and television media increasingly play a critical role in channeling public opinion, and public participation in the implementation of environmental impact assessments is starting to spread. More importantly, citizen-based environmental organizations are expanding rapidly. Although many remain under government control, a small but growing number now operate with a measure of independence. According to the Not-for-Profit Organization (NPO) network in Beijing, there are currently over 50 independent environmental NGOs operating in China.²⁶

Fourth, and perhaps most tentatively, it is increasingly recognized within policy-making circles in Beijing that the pursuit of economic growth at all costs is no longer environmentally or socially sustainable. In accordance with international guidelines, China adopted the concept of sustainable development in the mid-1990s. It was one

of the first developing countries to formulate its own Agenda 21 (a plan of action to promote sustainable development under the auspices of the United Nations) involving the integration of environmental goals into strategic development plans at national and local levels.

More recently, the more culturally aligned concept of *xietiao fazhan* (harmonious development) has reemerged in policy discourse. This first appeared over 30 years ago at the First National Conference on Environmental Protection in 1973. It simply referred to the need to balance development with nature. At the Third Plenary Session of the Sixteenth Party Central Committee in 2003, the interpretation was further expanded to include four more balancing aspects: urban and rural, economy and society, coastal and inland regions, and domestic and international.

BARRIERS TO ACTION

The above policy trends combined reveal that the central government's commitment to safeguarding the environment has increased significantly over the past decade. Major barriers, however, still remain. First and foremost is the lack of a centralized regulatory authority capable of mainstreaming environmental concerns into the decision-making process. The State Environmental Protection Agency has expanded its functional role in recent years to include a broad range of issues relating to pollution control, ecological conservation, mining, and nuclear safety, but it is still relatively weak compared to production-oriented agencies.

A second barrier is the inability of the central government to deliver environmental protection without strong political support at the local level. The main responsibility for implementing environmental policies and regulations lies with local government, but local government leaders often lack incentives to enforce national regulations because they have a vested interests in the enterprises they are supposed to be regulating. Even when the political will does exist, enforcement is often hampered by a lack of capacity. Many local agencies do not have sufficient funds, skills, or institutional support to carry out environmental reform.²⁷

A third barrier relates to weak legal enforcement. China has an impressive framework of environmental laws, and avenues are increasingly opening up for citizens to seek legal redress. The Chinese media have reported a growing number of cases where citizens have filed law suits against polluting enterprises. However, legal provisions in general are still prone to subjective interpretation, and the continuing reliance upon informal rather than rule-based mediation provides extensive opportunities for political intervention.

The fourth barrier is the continuing reliance on large-scale engineering projects

to solve environmental problems without giving adequate attention to the hidden economic, environmental, and human costs involved. In this regard, the highly controversial construction of the Three Gorges Dam (*San Xia*)—200 meters high and two kilometers wide—in the middle reaches of the Yangtze River is highly symbolic. The construction of the dam and what is now the world's largest hydroelectric power plant was recently completed; when it begins operation in 2008, it is expected to generate 18 gigawatts of electricity (equivalent to seven percent of China's total electricity production). The human and ecological costs have been well documented: officially, more than 1.5 million people will need to be relocated; silt buildup behind the dam is highly likely to place it in jeopardy, denying downstream regions of vital nutrients and stalling power generation; and much of China's finest scenery and wetlands habitat will be destroyed.²⁸

It is not the emphasis upon engineering solutions *per se* that is the problem. What is of concern is the obsession with scale. In the words of Vaclav Smil:

These megaprojects are responsible for a small share of overall ecosystemic degradation and environmental pollution, but they attract attention to these regrettable phenomena, and they symbolize the frequent failure of our designs to minimize environmental damage, to anticipate risks and to approach the harnessing of natural resources with at least some humility.²⁹

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From a broader perspective, China's environmental future rests on the degree of openness within the decision-making process, which, in turn, is contingent upon greater openness within society. As mentioned earlier, the media, NGOs, and other advocacy groups have done much to spread environmental awareness. Indeed, Chinese NGOs tend to place environmental education at the top of their agendas.

However, political constraints still greatly hinder informed public debate. To give a concrete example, in 2004 a coordinated NGO campaign against a proposal to build 13 hydroelectric dams on the Nu River in Yunnan province caught the attention of the central leadership. In early 2005, Premier Wen Jiabao placed a moratorium on the project until further environmental impact assessments (EIAs) could be carried out—an action hailed as a major victory for environmental advocates. But the follow-up process also revealed the serious limitations on public debate. The EIAs were conducted by a research institute with close ties to the hydropower corporations. At the local level, scientists were not able to speak openly about their findings, and some NGOs were held in contempt for expressing negative views. The latest reports suggest that four dams will now be built. For some this represents a minor success, for others it is a painful reminder of the bigger challenge that lies ahead. In the words of one environmentalist, "We are not opposed to dams *per se*—what we want is that people can make informed decisions."³⁰

From an environmental perspective, inclusive and open decision making is imperative because the choices available to decision-makers often pose dilemmas. It is not always easy to decide whether food security is more important than reducing pesticide use to improve water quality, or whether the protection of livelihoods is more important than the protection of ecological reserves. A sustainable development agenda aims to arrive at win-win scenarios, but in reality such an agenda can often mask difficult tradeoffs. Clearly, a balanced assessment cannot be made if decision-making power is concentrated in the hands of a few decision makers with strong interests in pursuing short-term gains at the expense of broader social concerns.

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The absence of genuine public consultation at the local level also obfuscates balanced tradeoffs because it increases the likelihood that environmental policies will place a disproportionate burden on the poor, exacerbating growing economic inequities. In this regard, a useful lesson can be gained from the experience of recent efforts to save the grasslands on the Qinghai–Tibetan Plateau. In this region of China the policy of *tui mu huan cao* (returning pasture to grassland) has led to the destruction of livelihoods for hundreds of pastoralists whose traditional practices offer a source of valuable indigenous knowledge that proponents of sustainable development cannot afford to lose.³¹

It is clear from the above discussion that tackling China's environmental crisis will require significant political and institutional reforms at the domestic level. Above all, open and inclusive decision making is an essential prerequisite for achieving more sustainable development outcomes on the ground. Given the transboundary nature of the crisis, greater efforts are also needed to enhance collective action at the international level. It is to this broader issue that we shall now turn.

NEW FRONTIERS IN ENVIRONMENTAL GOVERNANCE

In some ways, China's participation in global environmental governance sets it apart from other developing states. It has now signed over 50 international conventions on environmental protection. Considerable efforts have also been made to develop environmental cooperation at the bilateral level in the fields of energy conservation, biodiversity, forestry management, and cleaner production, to name a few. But at a more fundamental level, China's international stance has changed very little. Statements made at the World Summit on Sustainable Development in 2002 repeated the same

principles adopted at UNCED 10 years earlier. The only difference lies in a subtle shift toward recognizing the need for more cooperation at the global level.³²

The Chinese government's continuing reluctance to fully engage with environmental issues at the international level is inextricably bound up with its perceived identity as a developing state competing with richer industrialized states on an unequal footing. Ironically, the United States' recalcitrant position on the Kyoto Protocol negotiations has lent legitimacy to the Chinese response. The likely effectiveness of imposing mandatory emission reductions at the global level is a matter for debate. Nevertheless, by putting forward the notion that a binding commitment cannot be made because it would threaten economic growth, the Bush administration has unwittingly undermined its own policy of sharing responsibility with large developing states such as China, India, and Brazil.

Effective global environmental governance requires a reexamination of principles in accordance with the times. To paraphrase Jared Diamond, the modern world is replete with examples of states and communities clinging to principles and values under conditions where they no longer make sense.³³ It is clear that industrialized nations are largely responsible for the current state of the global environment, and as a consequence, ongoing efforts to transfer knowledge, funds, and clean technologies to developing states will remain important for many years to come. It is also clear that the scale of environmental damage brought on by China's economic rise, both within and beyond its borders, is historically unprecedented. International agreements, therefore, cannot work without active Chinese participation. However, in today's world the idea that certain states can be held fully responsible for the environmental spill-over effects of their economic activities is outdated.

Complete statistics are difficult to obtain, but it is obvious that a significant proportion of pollutants in China are generated from foreign firms, often taking advantage of lax regulations. It is also worth noting that a very different picture of global carbon emissions emerges if we take into account the issue of international trade. Accord-

With growing global interconnectedness, simple assertions of state responsibility for the environment no longer hold sway.

ing to a study by Bob Harriss and Shui Bin, China's carbon emissions would have been 14 percent lower in 2003 if it had not manufactured the products it exported to the United States, and, in turn, U.S. emissions would have been six percent higher if it had produced the goods domestically.³⁴ This demonstrates that with growing global interconnectedness, simple assertions of state responsibility for the environment no longer hold sway.

At the global level there is now an urgent need to recast the issue of responsibility

in less oppositional terms. One way forward would be to adopt the alternative principle of reciprocity. For many years China's efforts in dealing with its environmental crisis have benefited enormously from international support. Major donors such as the World Bank, the Asian Development Bank, and the Japan Bank for International Cooperation have provided billions of dollars in environmental loans and grants; China has also received significant funding from the Clean Development Mechanism under the Kyoto Protocol for the mitigation of greenhouse gases, and many countries are involved in promoting energy efficiency and conservation programs in China on a bilateral basis. A strong case can be made for China to reciprocate by transferring this experience to other developing countries. Chinese leadership in promoting environmentally sustainable development among developing countries would constitute a major step forward in protecting the global environment.

China also has an important leadership role to play in promoting an open and reciprocal environmental dialogue with its neighboring countries. In December 2005, the explosion of a state-owned petrochemical plant in Jilin province released tons of toxic benzene into the Songhua River, affecting water supply in Harbin as well as the Russian city of Khabarovsk. This environmental disaster has reinforced the need for preemptive action to set up monitoring and information disclosure systems across the Sino-Russian border.

In the past, China has been somewhat of a laggard in regional environmental governance. Despite continuing tensions over its dam building projects on the Mekong, it still refuses to become a member of the Mekong River Basin Commission. Attempts to establish an Acid Deposition Monitoring Network in East Asia and a Transboundary Biosphere Reserve in the Tumen River Delta have both been thwarted by Chinese opposition.³⁵ There are some signs, however, that this attitude may now be changing. China has recently participated in newly established environmental dialogues under the auspices of the ASEAN+1 and ASEAN+3 regional fora.³⁶

CONCLUSION

China's environmental crisis warrants serious attention at both the domestic and international levels. Any assessment of the likely threats to future economic development, as well as of China's relations with the outside world depends to a large degree, on the issue of adaptability. In reflecting back over the past decade it is clear that the Chinese government is capable of taking corrective measures. Overall efforts to protect the environment have been impressive relative to China's stage of development. Indeed, it would seem that the Chinese government now realizes its long-term stake in environmental protection to a greater degree than many other developing countries.

A further positive sign is the recent admission on the part of the central leadership that efforts to protect the environment so far have not been enough. In the words of Premier Wen Jiabao at a press conference in Beijing on 14 March 2006:

We have stressed the importance of taking remedies and measures after polluting the environment on various occasions and we also stressed the importance of leaving verdant mountains and clear water to the future generations in this country. This is not enough in itself. What is important is that we need to take practical and forceful measures to follow up these goals.³⁷

Improving environmental quality in China will require more than a strong declaration from above. Ultimately, rising pollution, the finite nature of China's resource base, and rapid urbanization mean that significant adjustments will have to be made to the current pattern of development. An urgent task in this regard is to improve the accountability of the decision-making process. At the same time, much more needs to be done at the international level. China's environmental fate is inextricably linked to the broader processes of globalization. In the future, a critical test of China's commitment to the environment will be the extent to which it takes a leadership role in shaping the future direction of global and regional environmental governance. The more sustainable rise of China may well be a long way off, but it is not entirely beyond reach. ●

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NOTES

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