

Bureaucracy Meets the Environment: Elite Perceptions in Six Chinese Cities*

Yanqi Tong

ABSTRACT A survey of local government officials and enterprise managers in six Chinese cities demonstrates relatively high environmental awareness. However, this awareness remains primarily an abstraction and does not always shape specific policy preferences. This article shows that the development-driven model works well overall, indicating the reluctance of policy makers to implement environmental protection policies at the cost of sacrificing the rate of economic growth. The pollution-driven model applies only to more developed areas, in which elites in more polluted cities are more concerned about environmental protection than those in less polluted cities. A non-linear model that takes into account the interaction between pollution and development works the best in explaining elites' policy preferences. It suggests that pollution becomes a significant factor affecting policy preferences only when a certain development level is reached.

Since inaugurating economic reform in 1978, China has placed the highest priority on economic development and has enjoyed more than two decades of rapid economic growth. However, with the remarkable economic performance has come serious environmental deterioration. Air and water pollution, acid rain, and desertification of grassland have reached unprecedented levels.¹ Despite the government's efforts to enact a number of major environmental measures and establish environmental protection agencies,² environmental deterioration continues in most places. The implementation of environmental policies is largely

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1 Vaclav Smil, *China's Environmental Crisis: An Inquiry into the Limits of National Development* (Armonk, NY: M.E. Sharpe, 1993); Li Rongxia, "Environment becoming of more concern to the public," *Beijing Review*, 3–9 May 1999, pp. 16–20; World Bank, *Clear Water, Blue Skies: China's Environment in the New Century* (Washington, DC: The World Bank, 1997); Li Wen, "China's environmental conditions in 1998," *Beijing Review*, 12 July 1999, pp. 13–18; *Agenda 21: China's White Paper on Population, Environment and Development in the 21st Century* (Beijing: China Environmental Science Press, 1994).

2 As of 1999, China has six comprehensive laws on environmental protection, nine laws on conservation of resources and 28 administrative regulations on environmental protection. Local governments have also issued over 900 regulations on environmental protection. China has also formed environmental protection agencies at all five administrative levels from the central authority to localities, and it has over 2,000 environmental monitoring stations.

ineffective, particularly when those policies conflict with economic development objectives.³

An effective environmental regulatory regime normally requires active societal participation in the government's policy process, with regard to both deliberation and implementation. While environmental protest movements and NGOs have become more active in recent years, the authoritarian nature of the political system keeps the bureaucracy at the centre of the policy-making process.⁴ Moreover, the localized nature of both economic development and environmental concerns places most environmental regulatory decisions squarely with local bureaucratic elites. Their perceptions of environmental problems and their preferences with regard to policies are therefore of crucial importance to environmental protection in China. While many government agencies have attached the label of "environmental" to their respective institutions, their understanding of environmental issues and their related policy preferences remain uncharted.

This article seeks to address the following questions. What is the state of environmental awareness among the local bureaucratic elites? Is there any correlation between their environmental awareness and their environmental policy preferences? And are there explanations for the variations in environmental awareness and policy preferences from one locality to another?

Survey and Sampling

In conjunction with the Research Centre for Contemporary China at Peking University, we conducted an attitudinal survey of local elites in six metropolitan areas in China in 1998 and 1999.⁵ The six cities surveyed represented different levels of both socioeconomic development and environmental pollution. These cities are: Shenyang in north China, an old industrial city dominated by state-owned heavy industry, which has experienced relatively slow economic growth during the period of reform; Shanghai, the economic and commercial centre of the country before the reform, which has experienced an economic boom as a result of the special privileges granted by the central government since the 1990s; Guangzhou, a city that has benefited the most from economic reform and has

3 Barbara Sinkule and Leonard Ortolano, *Implementing Environmental Policy in China* (London: Praeger, 1995).

4 For the more active environmental movements, see Yanqi Tong "Environmental movements in transitional societies: a comparative study of Taiwan and China," *Comparative Politics* (January 2005), pp. 167–88. For the role of the state in environmental protection, see Abigail R. Jahiel, "The contradictory impact of reform on environmental protection in China," *The China Quarterly*, No. 149 (1997), pp. 81–103; Michael T. Rock, "Integrating environmental and economic policy making in China and Taiwan," *American Behavioral Scientist*, Vol. 45, No. 9 (2002), pp. 1435–55; Jonathan Schwartz, "The impact of state capacity on enforcement of environmental policies: the case of China," *Journal of Environment & Development*, Vol. 12, No. 1 (2003), pp. 50–81.

5 The project was designed and carried out by the Research Centre for Contemporary China at Peking University in collaboration with the State Environmental Protection Bureau and the Environmental Protection Bureaus of Beijing, Shanghai, Guangzhou, Shenyang, Lanzhou and Chengdu, and Stanford University. It was funded by the Japan Foundation and Smith Richardson Foundation.

sustained a high growth rate during the reform era; Chengdu in south-west China and Lanzhou in north-west China, two interior cities that are less developed economically; and Beijing, the political centre of the country, where the local elite's awareness of national environmental issues is likely to have a big impact on national environmental policies. Of these, Shanghai and Beijing are centrally administrated cities and the other four are provincial capitals that have similar administrative status and structures.

In each of the six cities, we randomly selected 200 government officials and 100 enterprise managers to fill out the questionnaires. We started with a full list of all offices of the Party, government, people's congress and judiciary system at the rank of bureau (*ju* 局), department (*chu* 处) and desk (*ke* 科) in the government hierarchy. One hundred offices were randomly selected from the list, and the head and the deputy head of the selected offices became the designated respondents. Business managers were randomly selected from all the enterprises registered with the environment protection bureau of the city. The total number of returned questionnaires was 1,037 for government officials and 506 for enterprise managers. The response rate from both groups averaged around 85 per cent.⁶

Over the past decades, the State Bureau of Environmental Protection, the media and environmental NGOs have conducted many surveys regarding China's environmental issues. However, because the sampling methods of some surveys are questionable and most data bases are not accessible, none has been carefully analysed. Only a couple of surveys done by scholars have resulted in scholarly products. Among them were a survey of Guangzhou environmental officials (1990), a public opinion survey in Guangzhou (1996), and a comparative study of environmental officials in Guangzhou, Chengdu and Dalian (2000) on enforcement styles.⁷ The study of our survey results will be a significant addition to the existing scholarship as it goes beyond the environmental officials to all the local government officials and enterprise managers and covers a wider range of cities.

6 The high response rate, in the author's opinion, is the result of two factors. The first is the involvement of the environmental protection bureaus at both the national and local levels with the project. Secondly, Peking University is regarded as the top academic institution of the country and enjoys respect from the bureaucrats.

7 Hon. S. Chan and Kenneth K. K. Wong, "Environmental attitudes and concerns of the environmental protection bureaucrats in Guangzhou, People's Republic of China: implications for environmental policy implementation," *International Journal of Public Administration*, Vol. 17, No. 8 (1994), pp. 1523–54; Carlos Wing Hung Lo and Sai Wing Leung, "Environmental agency and public opinion in Guangzhou: the limits of a popular approach to environmental governance," *The China Quarterly*, No. 163 (2000), pp. 677–704; Carlos W. H. Lo and Gerald E. Fryxell, "Enforcement styles among environmental protection officials in China," *Journal of Public Policy*, Vol. 23, No. 1 (2003), pp. 81–115; and Shui-Yan Tang, Carlos Wing-Hung Lo and Gerald Fryxell, "Enforcement styles, organizational commitment, and enforcement effectiveness: an empirical study of local environmental protection officials in urban China," *Environment and Planning*, No. 35 (2003), pp. 75–94.

Competing Explanations: Economic Development versus Environmental Pollution

Environmental awareness and preference

As used in this article, the term “environmental awareness” includes three elements. The first is the knowledge and consciousness of environmental problems and their consequences. The second is the recognition that environmental protection policies are necessary. The third is the existence of what we call an ecocentric world-view, which involves a general perspective on a more harmonic human relationship with nature. We deem the third element important because, over the long term, world-views may play a role in directing future environmental perceptions and preferences.

While environmental awareness belongs to the perceptual level, what we call “environmental preference” touches on the policy level. It refers to the inclination to advocate or adopt more pro-environment policies. One of the central environmental dilemmas facing developing countries is the perceived conflict between economic growth and environmental protection. The general understanding is that rapid growth is adverse to environmental quality, and that environmental protection measures will slow down economic development. When faced with this contradiction, most governments in developing countries choose development over environmental concerns.⁸

What makes this dichotomy between economic development and environmental protection more salient in China is that China’s state bureaucracy carries a strong developmental orientation. A developmental state is one that is firmly committed to the development of the country and is willing and eager to use state power to promote, guide and generate rapid economic growth.⁹ With this commitment to economic growth, state officials may choose to overlook the degrading effect of economic growth on the environment. However, at the same time, the burden of protecting the environment is also laid squarely on the shoulder of the interventionist government.¹⁰ One aspect of this survey is to assess the extent to which this dual role of the government affects the policy preferences of its local officials.

What, then, would be the major factors that may affect the elite’s environmental awareness and preferences? The rest of this section elaborates on the two most plausible independent variables – economic development and environmental pollution.

8 Uday Desai (ed.), *Ecological Policy and Politics in Developing Countries: Economic Growth, Democracy, and Environment* (New York: State University of New York Press, 1998); and Chun Chieh Chi, “Growth with pollution: unsustainable development in Taiwan and its consequences,” *Studies in Comparative International Development*, Vol. 29, No. 2 (1994), pp. 23–47.

9 Meredith Woo-Cumings (ed.), *The Developmental State* (Ithaca & London: Cornell University Press, 1999).

10 Yang Ming, “Zhongguo gongzhong huanjing yishi de tezheng” (“The characteristics of public environmental awareness in China”), in Yang Ming (ed.), *Huanjing wenti yu huangjing yishi* (*Environmental Problems and Environmental Awareness*) (Beijing: Huaxia Press, 2002), p. 81.

The level of economic development

When environmental movements first originated in the post-industrialized societies, the traditional explanation of the rise of environmental awareness points to the level of economic development. Scholars argue that increasing concern with environmental protection is one part of the quality-of-life considerations that have emerged after successful economic development has delivered higher standards of living to the majority.¹¹ Ronald Inglehart further argues that once a society reaches the post-industrial stage, there will emerge, especially among the younger and better-educated generation, a strong trend towards post-materialist values. In this stage, the values of the public shift from an overwhelming emphasis on material well-being and physical security towards greater emphasis on the quality of life, most notably environmental quality concerns.¹²

A variant of this thesis is the belief that economic prosperity will increase human capacity, in both technology and resource terms, to deal with pollution. As Wilfred Beckerman puts it, “although economic growth usually leads to environmental deterioration in the early stages of the process, in the end the best – and probably the only – way to attain a decent environment in most countries is to become rich.”¹³ Since the 1990s, there has been a renewed interest in applying Kuznet’s curve, which originally hypothesized that income inequality first rises and then falls as economy develops, to the relationship between the level of income and environmental degradations.¹⁴ Unfortunately the research results so far are inconclusive.

Since the objective of this study is to investigate environmental awareness, not the actual levels of environmental pollution, it focuses on the first thesis, which emphasizes the changes in values and in subsequent policy preferences that come with economic development. Although China has not entered into a post-industrial stage, the idea that there may be a correlation between the level of economic development and environmental awareness is useful. One can predict that environmental awareness and policy preferences will be correlated with the level of development, such that the higher the level of economic development of a city, the stronger will be the environmental awareness and the preference for environmental protection policies.

To measure the level of economic development, we used such data as per capita GDP and per capita consumption of cultural and entertainment activities

11 Robert C. Paehlke, *Environmentalism and the Future of Progressive Politics* (New Haven: Yale University Press, 1989), p. 9; and Michael Redclift and David Goodman (eds.), *Environment and Development in Latin America: The Politics of Sustainability* (Manchester: Manchester University Press, 1991), p. 4.

12 Ronald Inglehart, *Culture Shift in Advanced Industrial Society* (Princeton: Princeton University Press, 1990), p. 5.

13 Wilfred Beckerman, “Economic growth and the environment: whose growth? Whose environment?” *World Development*, Vol. 20, No. 4 (1992), pp. 481–96.

14 David I. Stern, “The rise and fall of the environmental Kuznets curve,” *World Development*, Vol. 32, No. 8 (2004), pp. 1419–39; and Majid Ezzati, Burton Singer and Daniel Kammen, “Towards an integrated framework for development and environment policy: the dynamics of environmental Kuznets curves,” *World Development*, Vol. 29, No. 8 (2001), pp. 1421–34.

(Table 1). Overall, with regard to the levels of economic development, Guangzhou, Shanghai and Beijing are at the higher end of the spectrum. Shenyang, Chengdu and Lanzhou are at the lower end, with Lanzhou the lowest. Therefore, according to the ranking of the six cities, we would hypothesize that the environmental awareness and policy preference should be the strongest in Shanghai and Guangzhou, and the weakest in Lanzhou.

The level of environmental pollution

While the previous model attributes the rise of environmental awareness to affluence and post-materialist values, there are ample examples of rising environmental concerns in many developing countries.¹⁵ These concerns arise not from post-industrial styles of life, but primarily from environmental degradation that more immediately threatens the health and physical survival of the poor.¹⁶ They are mainly the reactions to environmental threats.¹⁷ It could conceivably be argued that environmental awareness may be triggered by serious environmental degradation, often involving pollution and contamination of air or water. The derived hypothesis therefore states that the higher the level of pollution in a given city, the more environmental awareness and the greater the preference for environmental protection policies. Conversely, the lower the level of pollution, the less is the level of environmental awareness and environmental policy preferences.

According to this hypothesis, the level of pollution in a given city will be the key factor determining environmental awareness and policy preferences. It proved difficult to construct a comprehensive index for all types of environmental pollution, because many crucial data are not easily accessible or comparable across the six cities. We therefore used the air quality index (Table 2) to guide the subsequent analyses. We fully understand that air quality is only one indicator of pollution and may not be a comprehensive measure of environmental conditions. However, it is one of the forms of pollution that are most detectable to the ordinary population, and therefore has a great impact on people's perceptions of environmental degradation.¹⁸

As shown in Table 2, Beijing and Lanzhou have the most serious air pollution among the six cities; Chengdu and Shanghai have the least, with Shenyang and Guangzhou falling in between. Casual travellers to these cities may confirm this

15 Yok-shiu F. Lee and Alvin Y. So, "Introduction," in Yok-shiu F. Lee and Alvin Y. So (eds.), *Asia's Environmental Movements: Comparative Perspectives* (New York: M. E. Sharpe, 1999), pp. 3–28; and David E. Bloom, "International public opinion on the environment," *Science*, No. 269 (21 July 1995), pp. 354–58.

16 Lee and So, "Introduction."

17 Chantal Seguin, Luc G. Pelletier and John Hunsley, "Toward a model of environmental activism," *Environment and Behavior*, Vol. 30, No. 5 (1998), pp. 628–52; and H. Kunreuther and P. Slovic, "Challenges in risk assessment and risk management," *Annals of the American Academy of Political and Social Sciences*, No. 545 (1996), pp. 1–220.

18 Newspapers in China started to report the air quality index of the major cities in recent years but no such reports are available on water quality. Admittedly, people in the north may be more aware of air problems while people in the south care more about water pollution.

Table 1: **Basic Economic Information of the Six Cities (1997/98)**

	Population (million)	GDP per capita (yuan)	Disposable income per urban resident	Spending on CER* per capita (yuan)
Shanghai	13.05/13.06	25,750/28,200	8,439/8,773	784/843
Guangzhou	6.66/6.74	24,900/32,663	10,445/11,256	1,072/1,063
Beijing	12.17/12.23	16,735/18,423	7,813/8,472	890/964
Shenyang	6.74/6.75	12,658/13,922	4,714/4,932	544/591
Chengdu	9.89/9.97	10,254/11,107	6,019/6,446	578/ 721
Lanzhou	2.8/2.84	8,769/9,196	3,906/4,554	n/a (304)** /322

Notes:

* CER refers to cultural, educational and recreational services.

** Figures in brackets are the provincial average.

Source:

Yearbooks of various cities, 1998 and 1999.

Table 2: **Air Quality of the Six Cities (1997/98)**

	Comprehensive air pollution index	Concentration of sulphur dioxide*	Total suspended particles*	Dust fallout**
Beijing	6.612/6.898	124/119	377/379	17.4/16.07
Lanzhou	6.205/5.493	72/62	741/632	27.1/25.99
Guangzhou	5.052/4.522	70/61	217/205	8.3/8.44
Shenyang	4.672/4.163	82/71	369/332	23.9/21.07
Shanghai	4.378/3.942	68/52	229/215	10.5/9.8
Chengdu	3.240/3.235	60/60	248/243	11.5/11.28
WHO standards		40–60	60–90	

Notes:

* microgram per cubic metre (annual mean concentration)

** ton per square kilometre/month

Source:

China Environment Yearbook, 1998 and 1999.

ranking of air pollution. Using the air pollution index as an independent variable, the pollution-driven model would predict that environmental awareness and preferences for environmental protection policies would be relatively strong in Beijing and Lanzhou, and weak in Chengdu and Shanghai.

Other models

The bureaucratic politics model has often been used in the analysis of environmental politics in the United States and Europe.¹⁹ In China, although the role of social groups in environmental protection is limited, bureaucratic interests and intra-bureaucratic conflict over resource allocation and policy priorities do exist.²⁰ There is a popular saying among Chinese bureaucrats that

19 Water A. Rosenbaum, *Environmental Politics and Policy* (2nd ed.) (Washington, DC: Congressional Quarterly Press, 1991).

20 Kenneth Lieberthal (ed.), *Bureaucracy, Politics, and Decision Making in Post-Mao China* (Berkeley: University of California Press, 1992).

“your buttocks determine your policy” – a Chinese version of Graham Allison’s classic statement that “where you stand depends on where you sit.”²¹ This model suggests that officials from different bureaucratic agencies will have different levels of environmental awareness and different policy preferences, as a result of their different institutional interests.

In the traditional analysis of environmental awareness and policy preferences, age, gender and education are also considered to be important variables.²² Such analysis predicts that the higher the level of education and the younger the generation, the stronger the environmental awareness and the preference for environmental protection policies. Similarly, feminist scholars argue that female citizens tend to have stronger environmental concerns than their male counterparts.

However, the analysis of the survey data did not demonstrate any significant impact of either bureaucratic or demographic variables on the environmental awareness and preferences of respondents. Some explanations to these weak correlations are offered below. As a result, our analysis focuses on economic development and environmental pollution as the primary independent variables. Since the economic and pollution information is based on individual cities, this study inevitably takes cities as the unit of analysis. As there was empirical evidence to support or contradict both hypotheses, the final analysis presents a model that incorporates both factors.

Environmental Awareness

Perceptions of local pollution

Respondents were given four choices to describe the state of pollution in their city: no pollution, some pollution, serious pollution and very serious pollution. The results showed that most of the respondents believed that there was either serious or very serious pollution in their locality (Figure 1).

This perceptual question is open to any kind of pollution. To test whether their perception is correlated with the actual air pollution level of the corresponding cities, we constructed an overall perceptual pollution score. We assigned rank values of 0 to 3 to the choices of “no pollution” to “very serious pollution” respectively, and the perceptual pollution score for a given group is the percentage of each rank times the rank value, summed over all ranks. We used the Comprehensive Air Pollution Index averaged over 1997 and 1998 as the Air Pollution Index in this analysis. Figure 2 shows that the overall pollution score is significantly correlated with the air pollution index ($p=0.0081$,

21 Interview with environmental officials in China, February 1999.

22 Robert Emmet Jones and Riley Dunlap, “The social bases of environmental concern: have they changed over time?” *Rural Sociology*, No. 57 (1992), pp. 28–47; and Kent D. Van Liere and Riley E. Dunlap, “The social basis of environmental concern,” *Public Opinion Quarterly*, Vol. 44, No. 2 (1980), pp. 181–97.

Figure 1: Impressions of Local Pollution

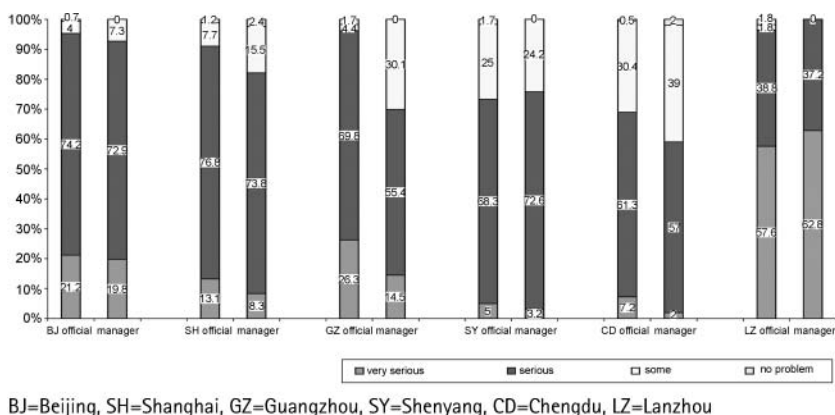
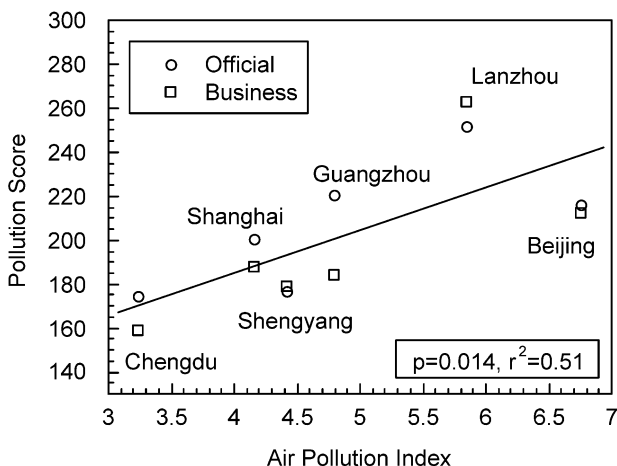


Figure 2: Correlation between Air Pollution Index and Pollution Score



$r^2=0.52$). This result, by indicating that on average the elite perception of pollution is consistent with the measured levels of air quality, supported our use of the air quality index to measure levels of environmental pollution in the ensuing analysis. The points for Lanzhou are substantially above the regression line, indicating that the respondents in Lanzhou seemed particularly aware of their pollution problem.

The importance of environmental problems and environmental protection

The survey included two questions to test respondents’ perceptions of the importance of environmental problems and environmental protection. It first asked them to rank in order the three most serious problems China is facing out

of six choices (maintaining social order, controlling population growth, providing employment, protecting the environment, promoting education and providing social security). All the respondents chose environmental protection as one of the three most serious problems, and most respondents ranked it as the most serious of all. When breaking down the data by city, environmental protection was ranked number one by all but Guangzhou (both government and enterprise) and Shanghai (enterprise only), for which it was ranked second. On average, population control and provision of employment were ranked the second and the third most serious problems respectively.

Secondly, we asked the respondents to mark the importance of environmental protection and economic development on a scale from 0 (least important) to 10 (most important). In order to avoid giving the impression that economic development and environmental protection are in a zero-sum conflict, we asked the respondents to rank them separately. The overwhelming majority of respondents believed that both goals are very important. The average score given by government officials to economic development was 9.21, whereas environmental protection received an average score of 9.18. Enterprise managers leaned slightly but not significantly towards environmental protection, giving it an average score of 9.23 while giving economic development an average score of 9.01. It seemed that the government officials were keenly interested in economic development, even more so than the managers ($p=0.007$). This may in fact reflect the mentality and the promotional mechanism of a developmental state. When governing record is primarily measured by growth, economic development is more important to government officials than to enterprise managers.

Ecocentric versus anthropocentric world-views

An ecocentric worldview holds that humanity is a part of an integrated planetary system that should be in some sort of balance. Usually, the environmental concerns that arise from short-term pollution come and go, while the concerns from a world-view perspective tend to be more enduring.²³ A more anthropocentric world-view, in contrast, puts humankind at the centre of the natural world. It emphasizes that the natural world should serve the needs of human beings and that mankind's technological advances will eventually solve environmental problems.

In order to determine the ecological world-views of the respondents, we constructed a world-view score using four questions. The first asked how respondents viewed human relations with nature – the extent to which they agreed that human beings should conquer, utilize or follow nature.²⁴ We

23 Robyn Eckersley, *Environmentalism and Political Theory: Toward an Ecocentric Approach* (New York: SUNY Press, 1992).

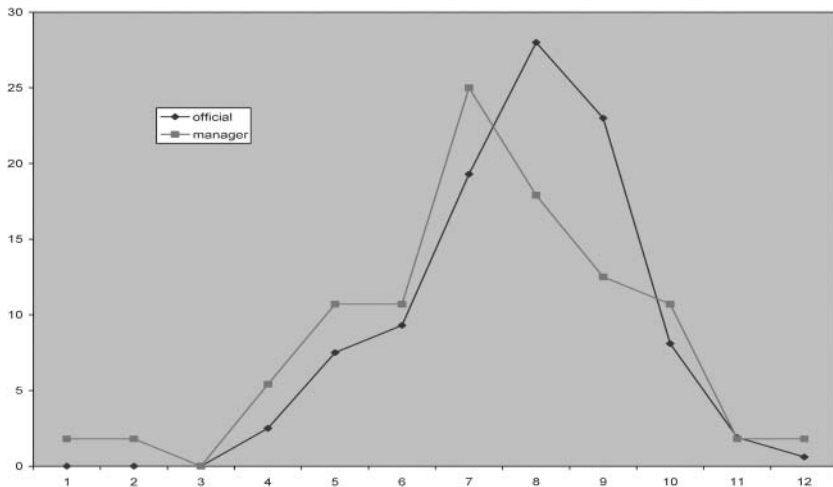
24 “Conquer” may sound harsh in English. Yet the Chinese version was so commonly used in propaganda materials, especially under Mao, that it represented a Chinese understanding of Marxist progressive philosophy. See also, Judith Shapiro, *Mao's War Against Nature: Politics and the Environment in Revolutionary China* (New York: Cambridge University Press, 2001).

assigned 1, 2 or 3 points to these respective choices. The second question asked about respondents' confidence in the capability of science and technology to tackle environmental problems. The third dealt with respondents' faith in development – whether or not they believed that development will eventually solve environmental problems. The fourth question asked whether the respondents agreed that nature would recover no matter what human beings do to it. For these three questions, we assigned 1 to 4 rank values to the answers from strongly agree to strongly disagree.²⁵ Based on the sum total of these rank values (4–15), we constructed a world-view score from 1 to 12, with 1 being the most anthropocentric and 12 the most ecocentric (Figure 3). We can see that while there was a normal distribution of opinion among the local elite, it tilted towards a more ecocentric worldview and the government officials have a slightly higher edge. The average was 7.8 for government officials and 7.2 for enterprise managers.

Summary: high environmental awareness and identical responses

The above results reveal that the overwhelming majority of the government officials and enterprise managers were aware of the seriousness of environmental pollution, acknowledged the importance of environmental protection and demonstrated a relatively ecocentric world-view. In other words, there was very high environmental awareness among local elites. This finding supports the

Figure 3: **Ecological World-view Score of the Respondents (percentage)**



Note:
1 as the most anthropocentric world-view and 12 as the most ecocentric world-view.

25 To avoid answering inertia, we placed these questions in separate groups and combined with other questions.

proposition that environmental protection is no longer a concept entertained only in post-industrialized societies, but has gained popularity in developing countries as well, including China. It is also consistent with Peter Ho's view that a "greening effect" in the central government has been disseminated to the local state bureaucracies.²⁶

We are aware that there may be a certain bias in the results. Because the respondents knew that this survey was about environmental awareness, they may consciously or unconsciously have tried to please the researchers, giving us the answers that they thought we would like to hear. Moreover, as elites, they knew very well that environmental protection has become an official concern in China, and they might have concluded that they should give the politically correct response. However, the fact that the idea of environmental protection has entered into the list of political correctness, measured not only by one single question that can easily be answered but by a more comprehensive world-view index, indicated that it has gained legitimacy among the local elites.

Since there is a high environmental awareness among the local elites across all the cities, we would argue that on an epistemic level, economic development and environmental pollution do not play a large role here as independent variables. Furthermore, contrary to the findings of another survey of the general Chinese public that there is a relatively strong correlation between education or generation and environmental awareness,²⁷ such correlation was not generally seen in our survey of government officials and enterprise managers. The distribution of answers was virtually identical across the board. One possible explanation is the levelling effect of the bureaucratic system. Once one enters the system, regardless one's level of education, one will receive the same amount and type of information. Therefore, level of education may no longer play an important role in determining environmental awareness. Furthermore, it can be argued that there is a re-training and re-educating mechanism within the Chinese bureaucratic structure that emphasizes unity of thought and unity of will. Regardless of age, education or gender, bureaucrats will develop similar awareness of real-life problems.

The only exception is the positive effect of education on the world-view of enterprise managers. Respondents with college or higher levels of education yielded a significantly higher mean score than that yielded by those with high school or lower levels of education ($p < 0.001$). This result provides additional support for the levelling effect of the bureaucratic system, which is not applicable to enterprises.

26 Peter Ho, "Greening without conflict? Environmentalism, NGOs and civil society in China," *Development and Change*, No. 32 (2001), pp. 893–921.

27 Yang Ming, "Zhongguo gongzhong huanjing yishi de tezheng" ("The characteristics of China's public environmental awareness"), in Yang Ming (ed.), *Huanjing wenti yu huangjing yishi (Environmental Problems and Environmental Awareness)* (Beijing: Huaxia Press, 2002), p. 81.

Environmental Policy Preferences

It is commonly assumed that a high level of environmental awareness will lead to respective environmental behaviour. Some scholars have argued that a set of post-modern values will translate into political action and demands, such as the emergence of the green movements and green parties in Western Europe.²⁸ Yet other scholars argue that there is no consistent evidence to support this thesis on the level of individual behaviour.²⁹ People do not always do what they believe to be the right thing, especially when doing the right thing involves high costs. There is a different set of factors that may shape their policy preferences. The challenge of policy-making is not only to choose the right thing to do, but more importantly, to balance competing demands with limited resources. Environmental policy preferences could be conditioned by various non-environmental considerations and competing priorities. This leads to the second major objective of this study: to measure the environmental policy preferences of local Chinese elites.

Factors affecting the implementation of environmental policies

In order to study the policy preferences of the respondents, we asked them to list the three most serious problems in the implementation of environmental protection policies. They were given five choices: environmental protection conflicts with economic development; non-environmental protection agencies protect their own interests and do not co-operate on environmental protection policies; enterprises only care about their own interest; policy enforcement is ineffective; and the masses lack environmental awareness. Some 51 per cent of the government officials and 63 per cent of the enterprise managers ranked “conflict with economic development” as the most important problem. Enterprise managers were more aware of this conflict than government officials ($p=0.012$). This result indicates that, although earlier in the survey the respondents had assigned equal importance to environmental protection as to economic development, they did perceive a conflict between these two, and consider this conflict as the most serious problem in environmental protection. Beyond this, 49 per cent of the government officials and 50 per cent of the enterprise managers listed “enterprises only care about their own interest” as the second most serious problem. Most of the government officials believed that ineffective enforcement is the third problem, while enterprise managers chose “masses lack environmental awareness.”

We asked the respondents whether they agree that the following factors are influential in shaping China’s environmental protection policy: media exposure,

28 Gerd Langguth, trans. Richard Straus, *The Green Factor in German Politics: From Protest Movement to Political Party* (Boulder, Co: Westview Press, 1986); and Inglehart, *Culture Shift in Advanced Industrial Society*.

29 Karl-Werner Brand, “Environmental consciousness and behavior: the greening of lifestyles,” in Michael Redclift and Graham Woodgate (eds.), *The International Handbook of Environmental Sociology* (Cheltenham: Edward Elgar, 1997), pp. 204–17.

mass complaints, attention of local governments, policy directive from the central government, central government enforcement and activities by social organizations. The results showed that the importance of both central and local governments was at the very top, with more than 90 per cent of the votes from both government officials and enterprise managers. The media came next with 90 and 87 per cent of votes. Mass complaints (54 and 58 per cent) and social organizations (24 and 34 per cent) were regarded as the least important factors. It is interesting to note that mass complaints were considered more influential than social organizations.

The respondents were then asked to select a factor that needs to be strengthened in order to improve environmental protection. Better implementation of the law occupied the first place. Increasing the resources given to environmental protection came second and stricter environmental legislation third. Only 1 per cent of the respondents thought that it would be necessary or desirable to strengthen social organizations.

These results show that, in the eyes of the respondents, the government at both the central and local levels was the most important factor in environmental protection. Not surprisingly, the respondents also believed that government action is the most effective way of improving environmental protection. In contrast, the creation of civil society was deemed neither necessary nor desirable. There were slight differences between officials and managers, with the latter assigning a greater role to mass complaints and social NGOs. This result reflected the strong state-centred approach to environmental protection. The popular approach that emphasizes soliciting societal support, which was supported and found in some local environmental protection agencies, was obviously not shared by the entire bureaucracy.³⁰ Moreover, since the respondents came from both the government and enterprises, their views are necessarily different from what Lo and Fryxell found in their studies of the environmental officials who were directly responsible for environmental enforcement, such as prioritization and public support.³¹

Economic development versus environmental protection

If there is a perceived conflict between economic development and environmental protection, the relative priority given to these two objectives will be an important factor in policy-making. We therefore asked the respondents the following question: "if slowing down the speed of economic development will protect the environment, do you agree to slow down economic growth?" Given our impression that local elites have a strong developmental orientation, it was somewhat surprising to find that, on average, 56 per cent of government officials and 57 per cent of enterprise managers said they would "agree" or "strongly agree" to slow down economic growth so as to protect the environment.

30 Lo and Leung, "Environmental agency and public opinion in Guangzhou."

31 Lo and Fryxell, "Enforcement styles among environmental protection officials."

There is some variance among different cities. Beijing scored an average of 61 per cent for officials and managers, Shanghai 50 per cent, Guangzhou 68 per cent, Shenyang 65 per cent, Chengdu 56 per cent and Lanzhou the lowest with 48 per cent. These variations may have reflected the differences in the level of economic development or environmental pollution. These figures are incorporated into a policy index for further analysis below.

Priority ranking

Government faces all kinds of tasks, and establishing the relative priorities among them is a central issue in policy-making. The establishment of priorities affects the distribution of resources and consequently the success or failure of policy implementation. In our questionnaire, we asked the respondents to rank in order various tasks their cities should address. The question asked, “if you were mayor, how would you rank the importance of the following tasks of the city?” Five tasks were provided: progress in science and technology, economic development, population control, environmental protection and social equality.

Almost all the cities produced the same rank order. Progress in science and technology received the highest number of votes, economic development ranked a close second, population control third, and environmental protection fourth, just before social equality. (The only exception was that the respondents from Shenyang put environmental protection third and population control fourth.) It is interesting to observe that the local elites put progress in science and technology in first place, instead of economic development which we predicted would receive the highest number of votes. This result indicates that the local elites have moved beyond the uni-dimensional pursuit of economic development and have adopted the belief that progress in science and technology would provide a long-term basis for modernization. At the same time, the concept of social equality, a traditional socialist value that emphasizes the assistance to the poor and the unfortunate, ranked low on the agenda of the local elites.

The most revealing finding was that, although environmental awareness in abstract is ranked very high by respondents, when they were forced to assign environmental protection a priority relative to other objectives, it was ranked fourth out of five. This finding demonstrates that high environmental awareness has not translated into policy preferences. Even if respondents might give “politically correct” responses when asked about local problems, assigning great weight to environmental protection, they tend to be more realistic when asked to set priorities among competing objectives.

Closing polluting enterprises

To test the policy preferences of our respondents further, we presented them with some hypothetical cases. We asked them to imagine three enterprises that were seriously polluting the environment. Their profit levels were different: one was average, one earned relatively good profits and the third was very profitable.

We asked the respondents whether they would agree to close any of these enterprises down.

The results showed that the willingness to close the polluting enterprise was correlated with its profitability. The higher the profit level, the less willing were the respondents to close it down. For example, 92 per cent of government officials and 82 per cent of enterprise managers agreed to close the enterprise earning average profits. About 65 per cent of government officials and 56 per cent of enterprise managers agreed to close down the enterprise that earned relatively high profits. But only 50 per cent of officials and 39 per cent of managers agreed to close the enterprise that was highly profitable. The enterprise managers were consistently more reluctant to close polluting enterprises than were government officials. In each case, their willingness to do so was about 10 percentage points lower than government officials (Figure 4).

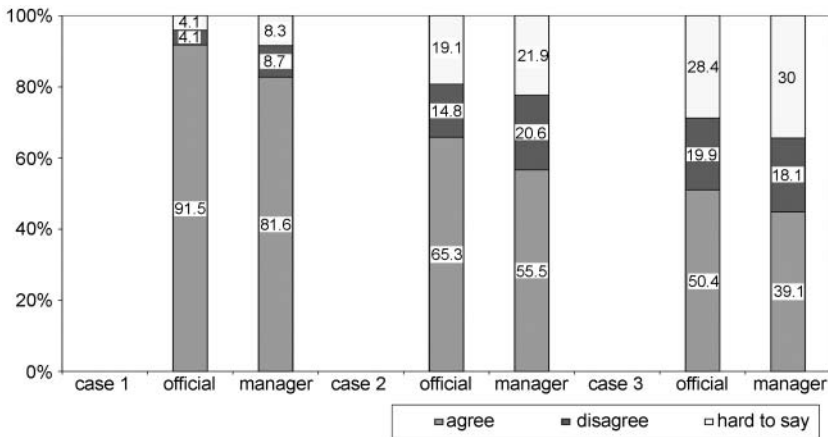
To take a closer look at these results, we broke down the willingness to close a highly profitable polluting enterprise by city (Figure 5). Respondents from Beijing demonstrated the greatest willingness to close the polluting enterprises (60 per cent of officials and 52 per cent of managers). Those from Lanzhou were least willing to do so (39 per cent and 35 per cent). The gap between the officials and enterprise managers was the largest in Shanghai, with 59 per cent of government officials and 33 per cent of enterprise managers agreeing to close the high-profit but high-polluting enterprise.

Summary: weak correlation between environmental awareness and policy preferences

The above discussion suggests that the environmental policy preferences of the local elites were weakly related to their high environmental awareness. The respondents acknowledged that economic development is in serious conflict with the goal of environmental protection. Yet when it came to concrete policy decisions, economic development took precedence. Environmental awareness in the abstract did not translate into a preference for environmental protection policy. The fourth place accorded to environmental protection in our priority ranking probably reflects its actual status compared with other goals.

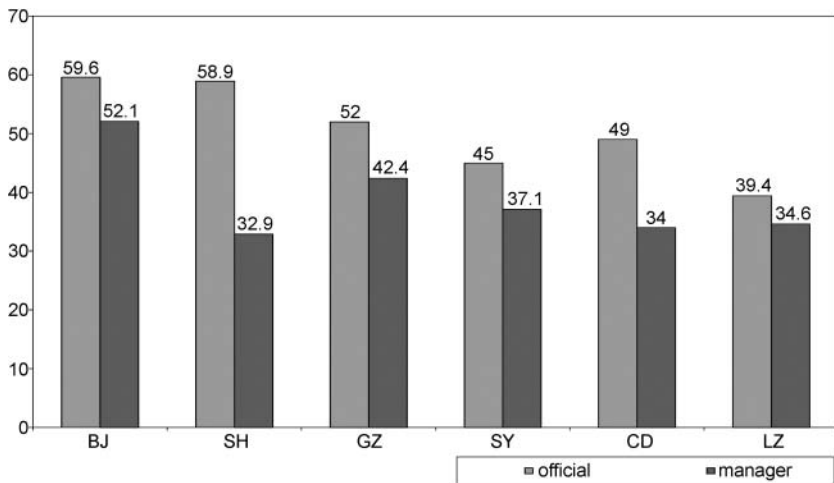
The hypothetical cases of closing polluting enterprises were very revealing. High profit enterprises are engines for local development. There was therefore a strong reluctance among local elites, especially the enterprise managers, to close down polluting enterprises if they contribute to the local economy. It appeared that, while environmental awareness among enterprise managers was as high as that among government officials, when it came to actual policy choices the former cared less about the environment. This difference may in part be due to the fact that government officials also shoulder the responsibility of protecting the environment, while the managers are only responsible for their economic enterprises and are profit driven.

Figure 4: **Preferences for Closing the Polluting Enterprises (percentage)**



Question: There are three polluting enterprises. One has average profit (case 1), one earns relatively good profits (case 2), and one is very profitable. Would you agree to close them down?

Figure 5: **Preferences for Closing the High Profit Polluting Enterprise by Cities (percentage)**



BJ=Beijing, SH=Shanghai, GZ=Guangzhou, SY=Shenyang, CD=Chengdu, LZ=Lanzhou

We found that there were conflicting data with regard to policy preferences. For example, most of the respondents ranked environmental protection as the fourth of five possible policy priorities, and yet over half of them agreed that it would be desirable to slow down the speed of economic development in order to

protect the environment. How can this be explained? We believe that China now is at a stage of rapid growth and swift changes, in which people's preferences shift between the old and the new. We do not see a set of black-and-white preferences, but rather a large grey area in which local elites pursue competing interests simultaneously. They may opt for economic growth in practice, but the idea of a balanced development strategy is equally preferable. Furthermore, this again reflects the dual role of government, which has responsibilities for both economic development and environmental protection.

Variation among Cities: Moving Towards a Non-linear Model

We have presented the findings of environmental awareness and preference of the local elites from six cities in China. This section returns to the two hypothetical models proposed earlier, the developmental model and the pollution model, and examines whether these models explain the observed variations among the survey cities.

Environmental awareness

It has been mentioned that the level of environmental awareness is generally high and there is little variation between governmental officials and enterprise managers and among the six cities. Here, we support this conclusion more formally.

To measure environmental awareness, we created an environmental awareness index (EAI), which includes three components: the perceptual pollution score (see Figure 2) indicating how much the respondents are aware of the degree of environmental pollution in their cities; the level of importance to protect the environment (1–10); and the world-view score (1–12). The EAI is the sum of the normalized values (deviation from the mean) of these three components. We also constructed an index to measure the level of development in the survey cities, which we refer to as the development index (DI). It is the sum of the normalized per capita GDP, disposable income and CER spending averaged over 1997 and 1998 (see Table 1).

There is no significant correlation between the EAI and DI ($r^2=0.05$, $p=0.51$), suggesting that the level of environmental awareness is independent of the local economic development. There is, however, a weak but significant correlation between EAI and the air pollution index (API) ($r^2=0.37$, $p=0.03$). This correlation is mostly the result of the fact that the perceptual pollution score is significantly correlated with the API (Figure 2). In fact, if the perceptual pollution score is removed from the EAI, the resulting index is not significantly correlated with the API ($r^2=0.02$, $p=0.63$). Any effort to construct more complicated models, such as using a multiple linear model or a non-linear model consisting of both independent variables, does not improve the statistical significance. This result suggests that environmental awareness does not follow either the developmental model or the pollution model.

Environmental policy preference

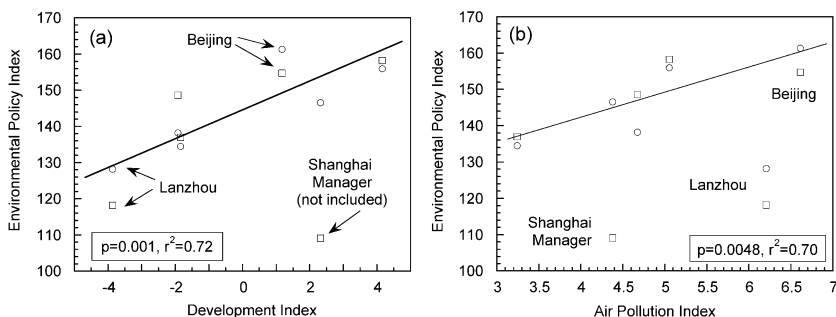
While economic development and environmental pollution do not have much explanatory power for environmental awareness, they do explain the variations in policy preferences. To further evaluate these models, we constructed an environmental policy index (EPI) to measure the respondents’ policy preferences between development and environmental protection. The index is the sum of three percentages yielded from three survey questions: percentage of respondents who consider environmental protection of higher priority than development; percentage of respondents who are willing to shut down the most profitable company causing pollution; and percentage of respondents who are willing to improve environmental quality at a cost of slowing down development.

The EPI is plotted against the DI and the API in Figure 6. Figure 6a shows that the EPI is significantly correlated with the DI ($r^2=0.71$ and $p=0.001$) when Shanghai managers are excluded. This strongly suggests that the developmental model is consistent with the data. Note that Beijing is sitting considerably higher above the linear prediction, and Lanzhou is relatively low. This observation is explained below. It is not clear why Shanghai enterprise elites are unusually pro-development.

Figure 6b compares the EPI with the API. Most groups seem to follow a linear trend, with high values on the EPI associated with high values on the API. However, in addition to the Shanghai managers, both governmental officials and enterprise managers from Lanzhou were significantly off the trend, indicating that these groups are much more pro-development than predicted by the API. If these three groups are removed from the linear regression analysis, the straight line explains 64 per cent of the variance in the EPI ($p=0.009$).

Multiple linear regression of the EPI against both DI and API only slightly improve the explanation of the variance by the development model alone (r^2 increased to 0.74 from 0.71), but the coefficient for API is not significant ($p=0.38$). While both independent variables play some role in the policy

Figure 6: The Effects of Development and Air Pollution on Environmental Policy Preferences



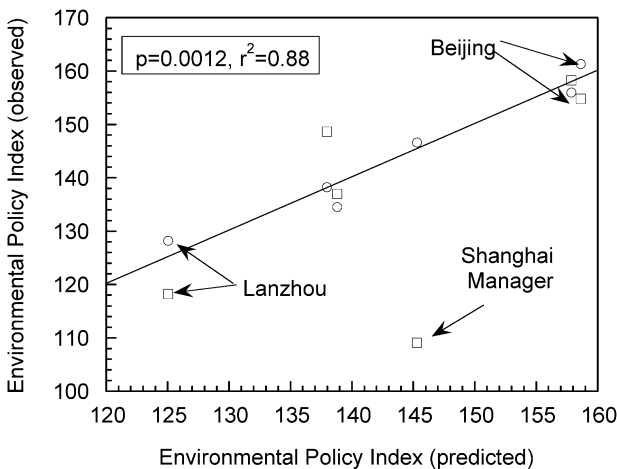
preferences of the respondents, it seems that the air quality does not become a significant factor until a certain development level is reached. This would explain the fact that Lanzhou is seriously polluted and yet the respondents are reluctant to give environmental protection a higher priority than development. In other words, there may be an interaction between the effects of air pollution and development, which can be examined by a nonlinear model:

$$\text{EPI} = a + b \bullet (\text{DI}) + c \bullet (\text{API}) + d \bullet (\text{DI}) \bullet (\text{API})$$

where a , b , c and d are constants. Figure 7 shows the result of this model, which has a r^2 value of 0.88 and p value of 0.0015, a significant improvement over the simple linear regression model against DI alone ($r^2=0.71$), and multiple linear regression against both DI and the API ($r^2=0.74$). The coefficients b and d are significant with probability values of 0.0008 and 0.028, respectively. The coefficient c is not significant with $p=0.13$. This indicates that the development is the most significant controlling factor in determining the policy preferences, and the second most important factor is the product of DI and API.

This model verifies our earlier speculation that there is indeed an interaction between the level of development and that of air pollution. The data for Lanzhou are well modelled by the nonlinear equation (Figure 7). The air pollution model overestimates the policy index values from Lanzhou because its developmental level is too low, and economic development was given a high priority by the respondents. Data from Beijing are also better explained by the nonlinear model. Since Beijing has both a high developmental level and serious air pollution, the elites in the city are particularly in favour of environmental protection. While the developmental index alone is not sufficient to model their policy preferences (Figure 6a), the nonlinear model adequately explains the high

Figure 7: **Environmental Policy Index as a Function of the Interaction of Development and Air Pollution Factors**



policy index values due to the development as well as air pollution levels (Figure 7).

In summary, economic development is the primary factor. In less developed areas, factors other than economic growth, such as pollution, do not play decisive roles in the policy-making process. Only when economic development has reached a certain stage does the degree of pollution begin to become a factor. In wealthier areas with few environmental problems, economic development can remain a priority. But in wealthier areas that suffer from pollution, environmental concerns become more prominent in the thinking of local elites.

Conclusion

The analysis above suggests several general conclusions. First, local government officials and enterprise managers in these six Chinese cities demonstrated a higher environmental awareness than what would be expected from a country driven by developmentalism in the past decades. As a general policy objective, environmental protection has gained legitimacy among local elites. However, this high environmental awareness remains primarily an abstraction, and does not always shape specific policy preferences. Even though local elites may understand that their localities have serious pollution problems and may agree that environmental issues are important, they tend to assign environmental protection a low priority when compared with other objectives, particularly economic development.

Contrary to the bureaucratic politics model, institutional interests did not seem to be decisive in elite policy preferences. The elite in economic departments did not necessarily oppose environmental policies, and non-economic agencies were equally enthusiastic about economic development. This may reflect the fact that on the one hand, a developmental state such as China assumes the responsibilities for both economic development and environmental protection, and on the other hand, a coherent bureaucratic system has a strong levelling effect.

Neither the level of development nor that of pollution alone could explain elite environmental preference. Instead, it is the interaction of the two at each locality that determined the elite environmental preference. Both development and pollution levels shape environmental policy preferences with a nonlinear relationship. The developmental factor works well in less developed areas, indicating the association between a low level of local development and reluctance of policy makers to implement environmental protection policies if they sacrifice rates of economic growth. The pollution factor works well only in more developed areas, showing that elites in less polluted cities are less concerned about environmental protection whereas elites in more polluted localities are more concerned. The non-linear interaction between development and pollution suggests that pollution would become a significant factor in policy preferences only when a certain level of development is reached. To a certain

extent, this finding supplements the discussion of an environmental Kuznet's curve. The thesis that environmental policy preferences of the elite increase with the levels of development and pollution may further explain the relationship between the rise of income and the reduction of environmental degradation.

Finally, we would like to note that these surveys were conducted between 1998 and 1999. To what extent do the conclusions remain valid for Chinese bureaucracy today? While it is most desirable to conduct a follow-up survey to establish a longitudinal trend, it is difficult to repeat large surveys of bureaucracy given the tremendous costs and the difficult political climate in China today. Nevertheless, we are confident in our conclusions. We do not think that there is sufficient empirical evidence that could invalidate our earlier findings. The environmental awareness of the elites is likely to remain high, if not higher, with the increasing popularity of a "green Olympics" and "green economy." Environmental preference may have increased in different places by different degrees, but the causal relationship established by the non-linear model remains a powerful explanatory tool. With a changing political landscape that gives more room to news media and societal environmental initiatives, it is conceivable that there may be other factors influencing elite environmental preference. Any answers need to be established by further research.