Controlling Local Environmental Performance: an analysis of three national environmental management programs in the context of regional disparities in China

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Whether government has the political will and capacity to control pollution is crucial for environmental outcomes. A vast country such as China, with centralized policymaking but idiosyncratic local implementation of environmental regulations and drastic regional disparities in wealth, raises the question how does the central government stimulate local environmental commitment to accommodate such diversity? In exploring this issue, this paper compares three national environmental management programs that are used as influencing and bargaining tools between the central and local governments of China: Quantitative Examination of Comprehensive Control of Urban Environment (1989), Model City for Protecting the Environment (1997) and pilot Green Gross Domestic Product (2005). Although the introduction of these schemes represents an important step forward in addressing demanding environment issues their impact is found to be mixed. However, each scheme also has something important to offer to this particular realm of environmental management and by recognizing and compiling their comparative advantages a number of policy implications for the future local commitment in and capacity of environmental protection are provided.

Keywords: Environmental management, regional disparities, government policy, incentives, China.

Political will and capacity of environmental protection

A large literature has suggested that bureaucracies have their own objectives that are not necessarily in line with the public interest.[1] Thus, researchers do not naively assume that environmental protection agencies are maximizers of social welfare. Instead, their political will and institutional capacity for solving environmental problems are considered to be crucial for environmental results. For example, recent cross-country studies point out that levels of transparency and corruption, reflecting the political will of a government to pursue public interests instead of their own, play an important role in controlling levels of pollution.[2] Studies also report that Chinese officials generally put economic growth before environmental protection and there is a lack of political will to clean up.[3] Furthermore, scholars and official reports by the OECD and the World Bank attribute the severe pollution in China largely to a lack of governmental capacity for strategic planning and the failure to implement environmental laws and policies.[4]

At the same time, the political will of environmental protection is a function of orientations of individual officials, structural and contextual factors in the political system, as well as local economic conditions. For example, in July 2007, in light of water pollution in Tai Lake, the former party secretary of Jiangsu province declared in public that he would

[1] Patrick Dunleavy, *Democracy, bureaucracy and public choice : economic explanations in political science*.(New York: Harvester Wheatsheaf, 1991), Leif Lewin, Donald Lavery, *Self-Interest and Public Interest in Western Politics*.(Oxford: Oxford University Press, 1991).

[2] Susmita Dasgupta, Kirk Hamilton, Kiran D. Pandey, David Wheeler, 'Environment During growth: Accounting for governance and vulnerability'. *World Development* 34(9), (2006), pp. 1597-1611, Ramón López, Siddhartha Mitra, 'Corruption, Pollution, and the Kuznets Environment Curve'. *Journal of Environmental Economics and Management* 40(2), (2000), pp. 137-150, Heinz Welsch, 'Corruption, Growth, and the Environment: A Cross-country Analysis'. *Environment and Development Economics* 9(5), (2004), pp. 663-693.

[3] Da Zhu and Jiang Ru, "Strategic Environmental Assessment in China: Motivations, Politics, and Effectiveness," *Journal of Environmental Management* 88: 4 (2008), pp. 615-626, Ming Wan, "China's economic growth and the environment in the Asia-Pacific region," *Asian Survey* 38: 4 (1998), pp. 365-378, Richard Lotspeich, Aimin Chen, 'Environmental protection in the people's republic of China'. *Journal of Contemporary China* 6(14), (1997), pp. 33-59.

[4] Elizabeth Economy, *The River Runs Black: The environmental challenge to China's future* (Ithaca: Cornell University Press, 2004), Xiaoying Ma and Leonard Ortolano, *Environmental Regulation in China: Institutions, Enforcement, and Compliance* (Lanham: Rowman & Littlefield, 2000), The World Bank, "China: Air, Land, and Water", (Washington, D.C.: The World Bank, 2001), OECD, "Governance in China", (Paris: OECD, 2005).

sacrifice gross domestic product (GDP) growth for better environmental quality.[5] The main implication of this is that municipal governments in Jiangsu may have to refuse some polluting industries that seek to locate in their jurisdictions, even though these industries might bring jobs and revenue. Meanwhile, a study by Lorentzen et al. (2010) found that age, tenure in office, overseas experience, and areas of specialization of Chinese mayors in the 113 centrally controlled key environmental protection cities in 2008 are relevant to their efforts of making environmental information publicly available.[6]

Figure 1 illustrates the structural context in which environmental protection agencies are operating in China. It can be seen that officials of environmental protection bureaus (EPBs) interact with and respond to pressures from industry, legislature, the public, non-governmental organizations, the mass media, and other government agencies that have their own policy priorities. The fragmentation of responsibilities for environmental infrastructure, implementing pollution control measures, and enforcement can arguably be seen to have worsened by the penetration of private business interests into the bureaucratic system, since it has largely led to local protection of business at the cost of the environment. Li (2011), in her comparative case study of the World Bank led pilot environmental information disclosure programs in Hohhot and Zhenjiang, found that because Hohhot was depending on a single dairy company for its tax revenue this particular company enjoyed overwhelming bargaining power and was able to block the environmental information from being published. In contrast, in Zhenjiang, where a large number of small and medium businesses are present, the

[5] Ke Zhang, 'Tai Lake Pollution Completely Damaged the Xiao Kang Societies in Suzhou, Wuxi, and Changzhou 太湖蓝藻事件颠覆苏锡常全面小康成果', *Zhongguo Wang* [China Net], < http://www.china.com.cn/city/txt/2007-07/11/content_8506372.htm>, posted 11 July 2007, accessed 1 September 2007.

[6] Peter L. Lorentzen, Pierre F. Landry, John K. Yasuda, 2010. Transparent Authoritarianism?: An Analysis of Political and Economic Barriers to Greater Government Transparency in China. Paper presented at the APSA 2010 Annual Meeting Paper, Washington D.C., 4 September 2010

experiment went through.[7] Along similar lines, Lorentzen et al. (2010) report that single-firm dominance correlates negatively with the pollution information transparency index score of a city.[8] Presumably, public pressure would provide government officials and politicians with the incentive to control pollution. In China, even though there has been a growing green public space,[9] the public has mainly focused on environmental issues that have immediate implications for their lives without bringing much change to the system. Thus, over the past 30 years or more, while more than forty national environmental laws and regulations have been passed,[10] local commitment in environmental protection cannot be assumed.

[Figure 1 is about here]

Meanwhile, even if EPBs are willing to enforce laws and regulations then, as Figure 1 further illustrates, it requires administrative capacity for them to work with the various actors in the system. The status and the resources at the disposal of EPBs have changed dramatically over time. At the central level, the Environmental Protection Bureau, a unit with a staff of 20, was set up in 1974 under the State Council. In 1982, three years after the promulgation of the Environmental Protection Law (for trial implementation), the State Council set up the Ministry of Urban and Rural Construction and Environmental Protection, incorporating the Environmental Protection Bureau within its structure. Subsequent reorganizations in 1984 and

[7] Wanxin Li, 'Self-motivated vs. forced disclosure of environmental information in China—a comparative case study of the pilot disclosure programs'. *The China Quarterly* 206, (2011), pp. 331-351.
[8] Lorentzen, Landry and Yasuda, "Transparent Authoritarianism?: An Analysis of Political and Economic Barriers to Greater Government Transparency in China."
[9] Yanxu Xu, 'Analyzing Environmental News Reports in the People's Daily in the Past 30 Years'. *Young News Reporter* 18, (2009), pp. 40-41, Goubin Yang, Craig Calhoun, 'Media, Civil Society, and the Rise of a Green Public Sphere in China'. *China Information* 21(2), (2007), pp. 211-236.
[10] Richard J. Ferris, Hongjun Zhang, 'Reaching out to the Rule of Law: China's Continuing Efforts to Develop An Effective Environmental Law Regime'. *William and Mary Bill of Rights Journal* 11, (2003), pp. 568 - 602, Abigail R. Jahiel, "The Organization of Environmental Protection in China'. *The China Quarterly* 156, (Special Issue: China's Environment), (1998), pp. 757-787.

1988 elevated the status of the environmental bureau to a separate office. Its staff size doubled from 60 to 120 persons, and it had dual subordination: to the Ministry of Construction and, at the same time, to the State Council's Environmental Protection Commission, which was an important forum for coordinating environmental management among different ministries. In 1990, the Bureau was separated from the Ministry of Construction and renamed the National Environmental Protection Agency (NEPA). Following this change its staff more than doubled again, from 120 to 320. In 1998, NEPA was renamed the State Environmental Protection Administration (SEPA). While this change coincided with its upgrading to a ministerial rank it was still not given a permanent seat in the State Council. In 2008, SEPA was restructured and renamed the Ministry of Environmental Protection (MEP), a full cabinet member of the State Council. Besides changes in status, the number of administrative organs has also changed over time. For example, there were 31 provincial, 1,458 prefectural, and 6,030 city/county EPBs in 1998, and 31 provincial, 2,019 prefectural and 7,655 city/county EPBs in 2005, respectively. Accordingly, the total number of EPB employees across the country increased from 105,932 in 1998 to 166,774 in 2005.

Recent studies have examined the institutional capacity of environmental agencies, that is, their ability to carry out environmental policies. Schwartz (2003) study of 10 Chinese provinces, for example, found evidence of a strong relationship between state capacity and subsequent environmental policy compliance.[11] Meanwhile, a study by Li and Zusman (2006) measured the institutional capacity of local EPBs in China and its effects on pollution discharge. Using a cross-sectional data set covering all 31 regions in the year 2002, they found that local EPBs with greater human capital (though, in this study, not necessarily

[11] Jonathan Schwartz, 'The Impact of State Capacity on Enforcement of Environmental Policies: The Case of China'. *The Journal of Environment & Development* 12(1), (2003), pp. 50-81.

greater financial resources) could enforce regulations more rigorously. However, they also found that these efforts did not necessarily lead to cleaner air or water because of other contingent factors that played a role.[12]

Overall, the available literature suggests that a combination of political will and government capacity for enforcement are crucial for protecting the environment. However, in a vast country such as China not only are these desired objectives difficult to foster but, as will be demonstrated in more detail below, they are likely to be mediated by disparities in wealth, population and the industrial context of the various localities concerned. For example, the extent of political will deemed necessary to protect the environment is likely to be influenced by the extent to which an area has already managed to develop and by broader pressures to maintain economic standards that are consistent with the most prosperous cities, provinces and regions. Thus, before exploring the content of the three national environmental management programs that have been deployed by central authorities to encourage a change of local political will in local actors and to enhance the capacity of the relevant institutional structure, the next section provides information about the nature and extent of China's regional disparity. In particular, attention will be drawn to the issues of wealth, economic performance and environmental governance capacity and their implications for environmental outcomes.

Regional disparities and the neglected environment

It has been widely acknowledged that China is an unevenly developed country. For the years from 1998 to 2005, we understand a region to have developed economically if its per capita

[12] Wanxin Li, Eric Zusman, 'Translating Regulatory Promise into Environmental Progress: Institutional Capacity and Environmental Regulation in China'. *Environmental Law Reporter: News and Analysis* 36(8), (2006), pp. 10616-10623.

GDP is above the same year national average; otherwise, it falls into the less-developed category. Regions that are economically better developed are listed in Table 1 in descending order by their per capita GDP. From 1998 to 2005, only Heilongjiang and Inner Mongolia were in and out of the list. All the other nine regions that appeared in the category of better-developed regions remained the same. Except for Beijing, the capital of China, the better-developed regions are all located along the east coast. Across a fairly short period of time, then, there has been little movement in wealth distribution of China at regional level.

[Table 1 is about here]

Furthermore, Table 2 indicates that rapid economic growth has been registered in both better- and less-developed regions. However, better-developed regions have become comparatively richer in 2005 than they were in 1998. Per capita GDP of the better-developed regions was 61.7 percent more than that of less-developed regions in 1998, but 63.1 percent more in 2005. Per capita income of urban residents[13] in better-developed regions was 30.5 percent higher than that of less-developed regions in 1998, but 36 percent higher in 2005. The t-test results indicate the differences are statistically significant at a 1 percent significance level.

[Table 2 is about here]

A normalized index of government capacity comprising the themes regional performance on environmental governance and the institutional capacity of local EPBs together with a

[13] Because the institutional apparatus for dealing with pollution in rural areas is not well developed, people implicitly limit their discussions of environmental governance to urban areas in China. As a consequence we adopt the per capita income of the urban population for our analysis.

business capacity index of the number of environmental professionals employed by an enterprise are reported in Table 3. It can be seen that the government capacity of better-developed regions was slightly higher (but this rate was statistically significant) than the government capacity of less-developed regions in both 1998 and 2005. However, no statistically significant difference was found in terms of business capacity either in 1998 or 2005.

[Table 3 is about here]

In order to examine differences in pollution discharge and treatment, we consider the following three major pollutants: industrial chemical oxygen demand (COD, a major water pollutant), sulfur dioxide (SO2, a major air pollutant that causes acid rain), and solid waste. Figure 2 illustrates that less-developed regions have witnessed a faster increase in pollution discharge and that the burden of pollution has been shifting from better to less-developed regions as time has gone by. In 1998 the better-developed discharged 37.79 percent (statistically significant) more COD compared with less-developed regions, but only 20.37 percent (not statistically significant) more in 2005. No significant differences have been found between the two groups in their total amount of industrial SO2 or solid waste discharge.

[Figure 2 is about here]

If we divide the total amount of pollutant discharge by the gross product of a region, we obtain the intensity of pollution discharge. As shown in Figure 3, less-developed regions experience much more intensive pollution than better-developed regions. The intensity of COD discharge was 69.77 percent and 1.26 times, SO2 1.74 percent and 1.11 times, and

industrial solid waste 1.49 times and 82.17 percent higher than that of better-developed regions in 1998 and 2005 respectively.

[Figure 3 is about here]

Both better and less-developed regions in China face the challenge of abating and controlling pollution, even though the severity of the environmental degradation and the capacity to address it varies from region to region in China. Figure 4 indicates that both better and less-developed regions have increased their investments in pollution abatement and control since 1998. However, better-developed regions have invested significantly more financial resources than less-developed regions in both 1998 and 2005.

[Figure 4 is about here]

From Figure 4 it is clear to see that better-developed regions have more resources and a greater capacity to protect the environment, while at the same time they are burdened with much lower pollution intensity than regions that are less developed. A question that naturally follows is how do more developed and less-developed regions compare in their efforts to deal with pollution? Table 4 reports the outcomes of pollution treatment for the following four indicators: (1) percentage of industrial wastewater discharge meeting standards, (2) percentage of municipal wastewater treated, (3) percentage of SO_2 discharge treated, and (4) percentage of solid waste reused. Although more highly developed regions performed better across most of these areas, less-developed regions have been catching up in the treatment of

industrial pollution. Still, however, they are far behind their more developed peers in controlling pollution from municipal sources. In 1998 and 2005, better-developed regions had 19 percent and 10 percent respectively more industrial wastewater discharge meeting environmental standards compared with less-developed regions; 8 per cent less but 5 percent more SO2 being treated; and 36 percent and 28 percent more solid waste being reused. Regarding municipal wastewater, better-developed regions treated 5 percent more than the less developed in 1998 and 27 percent more in 2005.

[Table 4 is about here]

Researchers, especially those who subscribe to the Environmental Kuznets Curve (EKC), argue that levels of economic development determine levels of pollution. If this is the case, people of the less developed regions will have to live with environmental degradation for a long period of time before their income rises to a level capable of changing the situation. Moreover, it is even possible that in the case of China the importance attached to pure economic growth could even lengthen this process if its 'development' is achieved at the expense of further environmental degradation. Hence, given the aforementioned divide between economically better-developed and less-developed regions government efforts to instill a change of political will may need to first circumnavigate the dangers associated with perversely incentivizing environmentally degrading economic growth in the process or effectively penalizing environmental 'laggards' through the distribution of rewards and sanctions that derive as a result of factors beyond the control of given circumstances. With these considerations in mind, the next section analyzes the three national management

programs adopted by the central government for stimulating local environmental commitment.

National environmental management programs for stimulating local environmental commitment

The Chinese central government has long realized that local governments have their own priorities and may see environmental challenges in a different light from the central government. Thus, besides environmental campaigns on an ad hoc basis,[14] it has developed three distinct national environment standards to simulate improvements in local environmental performance: Quantitative Examination of Comprehensive Control of Urban Environment (QECCUE),[15] Model City for Protecting the Environment (MCE) and Green GDP.[16] This section describes the initiation, focus and composition of each of the national environmental management programs before considering their implications for encouraging local commitment and capacity building of environmental protection. In each case, attention will also be drawn to the issues of how the aforementioned regional disparities in wealth and other factors could shape the degree of interest and participation in the schemes.

Quantitative Examination of Comprehensive Control of Urban Environment (QECCUE)

The Department of Pollution Control of the Ministry of Environmental Protection (MEP) of China has carried out a Quantitative Examination of Comprehensive Control of Urban

[14]The rule of law in China is weak. To improve compliance with national environmental regulations, the MEP has been conducting environmental campaigns on an ad hoc basis to enforce laws that should have been regularly observed. Among other authors, Rooij gave a good account on the phenomenon in his 2006 book. See Benjamin van Rooij, *Regulating Land and Pollution in China : Lawmaking, Compliance, and Enforcement : Theory and Cases*.(Leiden: Leiden University Press, 2006).

[15] Elizabeth Economy, Environmental Governance: the Emerging Economic Dimension. In N. T. Carter, & A. P. J. Mol (Eds.), *Environmental Governance in China* (pp. 23-41). London and New York: Routledge, 2007.

[16] Vic Li, Graeme Lang, 'China's "Green GDP" Experiment and the Struggle for Ecological Modernisation'. *Journal of Contemporary Asia* 40(1), (2010), pp. 44-62, Yan Li, Xia Huo, Junxiao Liu, Lin Peng, Weiqiu Li, Xijin Xu, 'Assessment of cadmium exposure for neonates in Guiyu, an electronic waste pollution site of China'. *Environmental Monitoring and Assessment* 177(1-4), (2011), pp. 343-351, Yongnian Zheng, Minjia Chen, 'Promoting Green GDP for More Balanced Development'. *Environmental Policy and Law* 37(5), (2007), pp. 416-421.

Environment (QECCUE) every year since 1989. Its main aims are to strengthen environmental protection at a city level, to expedite the construction of environmental infrastructure, and to incorporate environmental considerations in a city's development decision-making processes. In moving away from such traditional environmental management tools as qualitative inquiry and experience to embrace quantitative assessment via scientific protocol it can be seen to have addressed doubts about the objectivity associated with its predecessors.[17] Moreover, to increase the coverage of the program, the QECCUE is conducted at two different levels. Whereas the MEP compulsorily examines provincial capitals and key cities (113 cities) municipalities examine a selection of cities in their jurisdictions. Consequently, in 2007, a total of 617 cities participated in the QECCUE, of which 283 were of a prefecture level or above and 334 of a county level.

Participant cities are examined by their self-reported quality of the environment, results of pollution control efforts, outcomes of constructing environmental infrastructure, and environmental management capacity.[18] To ensure honesty in self-reported data by participant cities, the MEP conducts irregular spot-checks to the cities for data verification.[19] Furthermore, from 2002, disclosure requirements were added to the previous working procedures. For example, participant cities were required to publish in local newspapers the key environmental indicators before they were submitted to the MEP. Thereafter, the MEP will announce the names of the cities that are ranked in the top ten for environmental quality, environmental management, and environmental infrastructure construction, as well as the three cities that have made the most significant progress from the previous year. An "Annual

[17] Ministry of Environmental Protection (MEP), "Indicators for Quantitative Examination of Comprehensive Control of Urban Environment during the Tenth Five-Year Period 十五期间城市环境综合整治定量考核指标表", (2002).
[18] Ibid.
[19] Ministry of Environmental Protection (MEP), "Notice on Adjusting Indicators for Quantitative Examination of Comprehensive Control of Urban Environment during the Tenth Five-Year Period 关于调整《十五期间城市环境综合整治定量考核指标实施细则》的通知", (2002).

national report on comprehensive control and management of urban environment" is released by the MEP in conjunction with the annual "World Environment Day". Finally, since 2006, in response to rising public environmental awareness, the MEP has required participant cities to conduct a public survey asking for their levels of satisfaction with the local environmental management.[20] This seemingly small alteration reflects the possible emergence of a more open attitude to the use of public opinions as an important factor in deciding the outcomes of grant awards and could be a sign of future public involvement in government decision-making. In a number of different ways, then, the QECCUE has opened itself to increasingly levels of public scrutiny – public disclosure and satisfaction metrics.

One of the most interesting features of the QECCUE scheme is that it involves a degree of compulsion in its application. This is true of its selection of the provincial capitals and key cities which are necessarily included so as to ensure a statistically valid and geographically representative picture of environmental pollution across the country. The importance of this feature is that it overcomes the potential for self-selection bias and thus ensures a stronger link between state capacity and environmental compliance. As a result of being included within the scheme all participants have an incentive to improve their performance. On the contrary, it would be interesting to ascertain through further research whether the volunteered municipal level cities were selected on the basis that they represented the cream of the jurisdiction (cherry picking) concerned or a more random selection choice.

However, by focusing upon pollution outcomes rather than necessarily processes (efforts taken to control pollution) the QECCUE scheme also appears to inadvertently favor those localities that through history, development and given industrial structure are furnished with superior natural background factors. In fact, this hypothesis is borne by the evidence of

[20] Ibid.

the top ten performing cities which, amongst a pool of 109 key cities (excluding the four centrally controlled cities), have tended to be drawn from more developed regions. Thus, across the five dimensions of environmental performance considered in the 2007 study cities from less developed regions tended to have fewer top ten cities than their more developed counters. Five cities from less-developed cities were included within the top-ten 'Air Pollution Index', three in the 'Sulfur dioxide levels' and 'Municipal solid waste' categories, two in the 'Municipal waste water' and 'Green space' categories and one in the 'Medical hazardous waste' category. Of course, these figures represent fairly broad based overviews and more details would be required to ascertain for example whether the areas listed are particularly industrialized or typical of their broader region i.e. a comparatively rich city within a poor location.

Finally, although some of the less-developed localities might have an opportunity to demonstrate greater improvement than their more economically developed counterparts – since they have more scope to advance a low level of current environmental performance – only three, rather than ten, places are singled out for this aspect of performance. Relatedly, it is possible that a particular city could make a one-off gain if it closes an extractive industry, perhaps as part of its developmental upgrading to a more technologically advanced and cleaner industry, but it would remain questionable whether such gains really represent improvement in the fullest sense of the term if all the other activities in the area maintain a 'business as usual' attitude.

Model City for Protecting the Environment (MCE)

The scheme, Model City for Protecting the Environment, was first proposed in 1997 in the

"Ninth Five-year Plan for Environmental Protection and the 2010 Long-Term Goals" by the then State Environmental Protection Administration (upgraded to MEP in 2008). It was built on the QECCUE and added indicators of economy and society to make sure the model cities are not only environmentally friendly but also economically prosperous and socially harmonious. Unlike the QECCUE, the MEP set target values on the indicators and only those cities that have met the targets can become MCEs.

The MCE scheme is open for voluntary participation by all the cities and urban districts in China. However, rules govern the admission procedures of those seeking participation. For example, interested cities must first submit an application to the MEP together with their plans for constructing a MCE. Moreover, in demonstrating eligibility for inclusion within the scheme interested cities have to meet the following three conditions: attainment of target reductions in total pollution discharge, no serious environmental accidents or violations of environmental regulations, and the establishment of a plan for environmental emergencies. If a city has met these conditions, the MEP will conduct a spot check and on-site examination, before publishing the results in specified local newspapers for at least 10 days for public comment. Upon acceptance the title of 'MCE' will be granted at a formal meeting held by the MEP. By 2010, a total of 76 cities or urban districts had been granted the title of MCE. All the MCEs have to pass the 'returning checks' by the MEP to maintain their status on a rolling three year basis. Since 2007, the MEP has required applicant cities to include the aforementioned public satisfaction with the environmental management in the city.[21]

In contrast to the QECCUE, then, one of the core features of the MCE scheme is its

[21] Ministry of Environmental Protection (MEP), *Evaluation Criteria and Implementation Guidelines for National Model City for Protecting the Environment during the Eleventh Five-Year Plan Period (Revised)* *"十一五"国家环境保护模范城市考核指标及其实施细则（修订）*. 2008.

voluntary nature. Although there could be a variety of different reasons that localities might choose to opt for the scheme, which could be a combination of genuine environmental motivation, personal gain for responsible officials or to enhance the bargaining power of the EPB of a city, it can be reasonably hypothesized that better developed areas will have a greater chance of being accepted since they will have more likely met the outcome targets than their less well off counterparts. As Figure 4 demonstrated earlier better-developed regions have more resources and a greater capacity to protect the environment, while at the same time they are burdened with much lower pollution intensity than regions that are less developed. In fact, this hypothesis that 'better developed regions will be more highly represented in MCE awards' is supported by the empirical evidence. Since the scheme started in 1997 only eight out of 76 cities were drawn from the less-developed regions (10.5%). In addition, the vast majority were also drawn from regions on the East coast (see Figure 5). However, when the figures are dissected longitudinally there is also evidence that cities from less-developed regions have improved their standing over time. For example, seven of the eight cities from the less developed regions awarded MCE status have been granted this title post-2004. This means that their overall share of cities from 2004 has reached a more respectable 17 per cent (7/41). Another advantage to cities from less-developed regions being granted the MCE status is that they could become exemplars for other cities within the region.

(Figure 5 is about here)

As to the question why do particular model cities apply for the scheme, it seems, as alluded to earlier, that this could be a function of local officials seeking/obtaining increased bargaining

power to push a green agenda for their cities. For example, by defining what makes a desirable urban jurisdiction and publicly acknowledging the ones that have met the criteria, the MEP blended environmental considerations in the pursuit of economic development. If a local government decides to bid for MCE status the local political ecology could change as EPB officials could obtain more negotiating power in government decision-making than their counterparts in another city that do not aim for the scheme. If this additional negotiating power is used wisely then it could be used to secure further gains from finance, planning and construction authorities so as to secure permission for additional environmental infrastructure projects that further the green momentum. Again, empirical evidence has emerged to support this potential. Li's (2011) study of Zhenjiang, for example, found that since gaining the national award of "model city for protecting the environment" in 2004 its monitoring station budget, which had been maintained at a consistent level of 4 million Yuan between 1994-2002, subsequently grew. For example, the monitoring budget was increased to 4.8 million Yuan in 2003 and then to 7 million Yuan in 2004 (4 million set aside for purchasing monitoring equipment). By 2005 it had grown to 9 million Yuan.[22]

Finally, for the key officials involved there is the possibility that a successful MCE bid could further their career potential. It would demonstrate good leadership qualities, an ability to organize and to conform against pressing targets and standards. Thus, in addition to being able to secure enhanced bargaining power there could also be personal motivation/incentivizing factors at play.

Green GDP

[22] Li, "Self-motivated vs. forced disclosure of environmental information in China—a comparative case study of the pilot disclosure programs."

During the 2005 National People's Congress (NPC) and Chinese People's Political Consultative Conference (CPPCC) sessions, the State Environmental Protection Administration (SEPA), together with the National Bureau of Statistics (NBS), launched a pilot green GDP accounting program in ten provinces and municipalities[23] (consistent with the other two schemes only two of these localities, Anhui and Chongqing, are less developed than average). On September7, 2006 SEPA and NBS together published the "China Green National Accounting Study Report 2004"[24] and announced the first green GDP analysis, taking into account the damage inflicted on natural resources and human health by pollution. It also projected the costs of pollution control if the national ambient environmental standards were met. However, because of difficulties in obtaining necessary data and disagreements among experts on methodology of calculating ecological and environmental losses, the pilot Green GDP exercise, both as a concept and as a practice, remains rooted at an early stage in China.[25] For example, the NBS was concerned about the rigor of the calculations involved and even hesitated to put its name on the 2006 report. It also failed to confirm its continued commitment to the scheme in the light of these reservations.

At the same time, because local participation in the Green GDP program was voluntary, all ten volunteer regions decided to drop out of the scheme and no new provinces stepped in to fill the gap. One of the reasons for the lack of provincial commitment was that by deducting environmental costs from their regional gross product, it served to lower their economic performance. One of the major problems in this regard is one of broader system co-

[23] The ten provinces and municipalities selected are Anhui, Beijing, Chongqing, Guangdong, Hainan, Hebei, Liaoning, Sichuan, Tianjin and Zhejiang.
[24] "China Green National Accounting Study Report 2004-Public Version" published by the SEPA/NBS, available in full online: <http://www.sepa.gov.cn/plan/gongwen/200609/P020060908545859361774.pdf>, accessed 25 October 2010.
[25] State Environmental Protection Administration, National Bureau of Statistics of China, *China Green National Accounting Study Report 2004 - Public Version 中国绿色国民经济核算研究报告*. Beijing: State Environmental Protection Administration & National Bureau of Statistics of China, 2006.

ordination and the fact that because the standard GDP growth rate remains the major determinant of a governor or a mayor's career advancement, local governments prefer high GDP growth rates as opposed to potentially more accurate, or sustainable, environmentally-adjusted ones. No single province was, therefore, willing to be effectively 'penalized' by a smaller GDP growth rate as a result of being included as a volunteer in the Green GDP program. Consequently, the report released in 2006 has become the only official Green GDP report in China so far.[26]

It is true that the scientific reservations about Green GDP are important if an accurate and robust picture of economically induced environmental damage is to emerge. Moreover, technical difficulties have not prevented other countries from adopting alternative metrics to GDP to assess a more rounded picture of social progress such as sustainability and quality of life assessments.[27] Of course, while the definition of 'green GDP' remains ultimately a normative exercise, which would worry those guided by a more robust statistical bent, problems with pure GDP exist also. The challenge here then is how to ensure that agreements are reached while using the data for information gathering purposes rather than to name and shame the poor performers. Thus in the correct institutional setting it might be possible to encourage greater participation from provinces or require a contextually sensitive compulsory adoption of the scheme. In this sense there are lessons to be learnt from the QECCUE scheme.

Implications for local commitment in and capacity of environmental protection

This paper has examined the three environmental management programs adopted by the MEP

[26] Interviews with responsible persons for the Green GDP program with the Ministry of Environmental Protection.
[27] Bhutan offers an interesting example of a different path of development guided by a paradigm setting apart from the dominant emphasis on GDP growth. Bhutan's former King Jigme Singye Wangchuck coined the term of Gross National Happiness (GNH) in 1972 to signal his commitment to building an economy that would serve Bhutan's unique culture based on Buddhist spiritual values. The Centre for Bhutan Studies, "Gross National Happiness", accessed 5 December 2010.

to help redefine local priorities in relation to economic progress by adopting environmental indicators for evaluating local government progress. In undertaking this examination, coverage has been directed to differences in initiation, focus and composition, while paying particular attention to the mediating factors of economic development, history and location (e.g. coal mining region). However, even though there are limitations with each of the schemes they all have something positive to contribute to the broader environmental cause, and it seems that the next challenge could involve grasping the various opportunities arising and to combining some of the most important features identified.

For a participant city of QECCUE, its EPB has to collect certified information sheets from construction bureau (environmental infrastructure and wastewater treatment plant), utility companies (drinking water), and transportation bureau (vehicle registration and use). Then it checks the data and submits the compiled information to the Ministry of Environmental Protection, of which two officials are in charge of the program. Instead of digesting, processing, and utilizing the information collected to help diagnose local environmental problems, EPBs wait for the ranking results to be announced by the MEP then take remedial actions if their performance is comparatively poor. The advantage of this scheme it seems is that by embodying a degree of compulsion it can garner the necessary state capacity to ensure local compliance. However, greater attention is needed to ensure that in terms of best and most improving localities both the context and the processes that have been behind the registered performance are more clearly recognized.

In contrast, the MCE only highlights exemplary cities that have done what is considered to be an excellent job in protecting the environment and is therefore very much likely to be influenced by prevailing economic development and wealth factors of the

localities concerned. Moreover, if this potential is used wisely to subsequently persuade the development of additional infrastructure projects then it could further exacerbate the gap between the environmentally progressive and environmentally regressive localities and negate the development of a more rounded scheme. Thus, means must be devised to get around this problem and for incentivizing less developed regions for participating in such a scheme. Otherwise, social disparities could merely be replicated in terms of increased environmental disparities. However, the particular reasons behind certain cities entering the scheme is worthy of more detailed empirical attention especially if central government is to understand the causal process factors behind these decisions, helping them to unlock the political will of local actors in tackling environmental issues. At the same time, an interesting feature of the MCE scheme is that it also expands the remit of the environmental agenda in a direction of social harmony, which would be the obvious next step for some of the more advanced cities to address once the basic environmental and economic standards have been achieved.

The use of public satisfaction indicators in both QECCUE and MCE is an important development also and represents an interesting attempt to pluralize local politics. However, to ascertain the precise merits of this development further scrutiny of their source, coverage and operation needs to be conducted to ensure that they are not subject to game playing or other manipulation factors. Likewise, in opening up the environment agenda to broader political appeal the citizens of China must also be made more wary of the environmental implications of their consumption decisions, something that strikes at the heart of the distributional theme running throughout this paper. Environmental and social inequities tend to run in tandem.

Thirdly, the Green GDP program has undoubtedly stimulated a lot of debates and negotiations, and attracted international as well as domestic attention. Unlike the first two

programs that were invented by Chinese government officials, green accounting has been intensively studied by professionals both in western countries and China. However, because of the huge importance attached to the GDP growth rate no province or municipality was willing to displace their higher GDP rate with a lower Green GDP adjusted output figure. Likewise, the NBS did not want to risk their professional reputation by publishing what could be perceived as a non-scientific set of data. In both these ways, then, there appears to be a pressing need for the various actors to engage in more mature and open debate about the source and extent of GDP. Otherwise, if the mainstream evaluation system of government officials remains committed to the size of GDP instead of comparing it against inputs and examining broader life issues, local governments can hardly be criticized for lacking the self-motivation to pursue clean development.

Moreover, while the MEP attempted to solve the motivation problem by adopting a green national accounting system it failed because it did not have the authority to force the NBS to cooperate and the regions to join. Realistically, the MEP could have used the national environmental management programs to build local capacity and to prepare local EPBs for working effectively with other government agencies, industry, and the public. For example, beyond fulfilling the reporting requirements from the MEP, the comprehensive information collected by the QECCUE could have been used by the local EPBs to diagnose local environmental problems and to seek resources from the various parties for improving local environmental performance. This then provides an example of how two of the existing schemes QECCUE and Green GDP can be combined.

Moreover, despite the technical and political challenges in promoting the Green GDP scheme SEPA nonetheless set out to change the prevailing mindset of local government

officials by warning the country of the danger of a single-minded pursuit of economic growth and for this reason alone its broad based message remains an important one in the overall scheme of things. In fact, the incorporation of environmental and social concerns in national development strategies has gradually helped to de-legitimize the exclusive attention to economic growth in China. For example, the State Council endorsed a national Sustainable Development Strategy in the 21st century in 2003 and President Hu Jintao called for a scientific approach to development and the building a harmonious society in 2005.[28] Riding on the wave of environmental concern, SEPA announced environmentally adjusted GDP growth rate in 2006 aiming to alarm provincial governments as well as the public about losses caused by pollution and the danger of the single-minded pursuit of economic growth in China. In the same year, the State Council announced pollution reduction and energy efficiency targets in the 11th Five-Year Plan.

The cadre evaluation systems were also modified accordingly, thus forcing local government officials to take into consideration sustainability issues. For the first time in history, then, the responsible officials in local governments are being evaluated by environmental quality (outcome) and their efforts for controlling pollution (process) within their jurisdictions and this development has changed the rules of the game. Moreover, in what is the final year of the 11th Five-Year Plan, official concerns about not being able to meet the environmental targets have appeared in the news quite often.

Thus, what is needed in China is not only a greater recognition of the context within which different localities operate but also to provide actors with the necessary capacity to enforce change. Too much of the current efforts, by being voluntary, appear to reinforce

[28] Wu highlighted the unintended failure of the "Scientific Development" in bringing about a harmonious society in China. Guoguang Wu, 'China in 2010: Dilemmas of "Scientific Development"'. *Asian Survey* 51(1), (2011), pp. 18-32.

existing disparities in wealth, population and industrial context and without a change in mentality, the environmental protection in China will rely mainly on ad hoc campaigns and constantly changing targets but not institutionalized management tools and regulations. However, this initial period of learning is perhaps a necessary one if the wrong types of incentives are not to be pursued more fully.

Figure 1. Structural context of environmental protection agencies in China

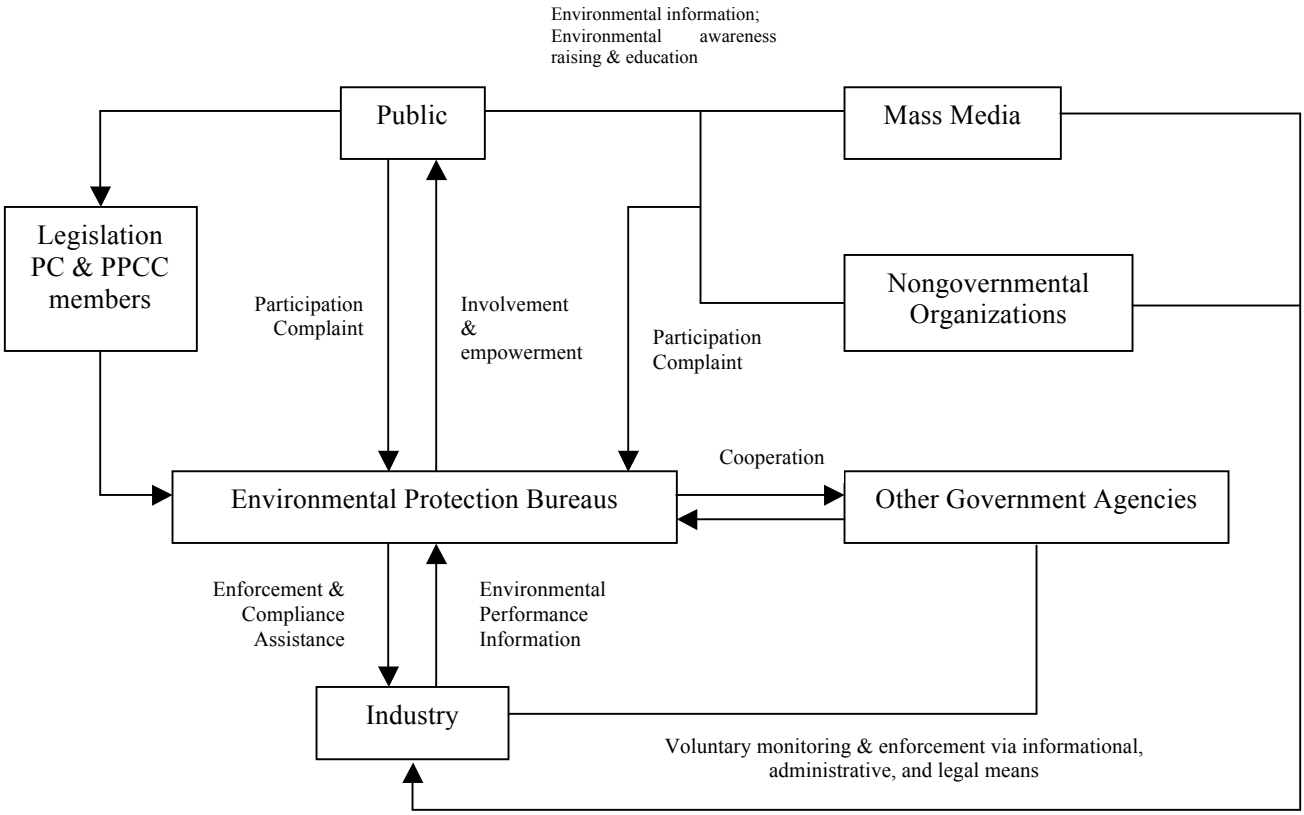

Table 1. Regions with per capita GDP above national average in 1998 and 2005

Ranking	1998	1999	2000	2001	2002	2003	2004	2005
1	Shanghai	Shanghai	Shanghai	Shanghai	Shanghai	Shanghai	Shanghai	Shanghai
2	Beijing	Beijing	Beijing	Beijing	Beijing	Beijing	Beijing	Beijing
3	Tianjin	Tianjin	Tianjin	Tianjin	Tianjin	Tianjin	Tianjin	Tianjin
4	Zhejiang	Zhejiang	Zhejiang	Guangdong	Zhejiang	Zhejiang	Zhejiang	Zhejiang
5	Guangdong	Guangdong	Jiangsu	Zhejiang	Guangdong	Guangdong	Guangdong	Jiangsu
6	Fujian	Fujian	Fujian	Jiangsu	Jiangsu	Jiangsu	Jiangsu	Guangdong
7	Jiangsu	Jiangsu	Guangdong	Liaoning	Liaoning	Fujian	Fujian	Shandong
8	Liaoning	Liaoning	Liaoning	Fujian	Fujian	Liaoning	Shandong	Liaoning
9	Shandong	Shandong	Shandong	Shandong	Shandong	Shandong	Liaoning	Fujian
10	Heilongjiang	Heilongjiang	Heilongjiang					Inner Mongolia

Table 2. Economic Performance of Economically Less and Better Developed Regions

	Per capita GDP (yuan)		Per capita income (yuan)	
	1998	2005	1998	2005
National mean	7,323	16,020	5,582	10,916
Mean (better developed)	12,592	27,981	7,004	14,442
Mean (less developed)	4,824	10,324	4,870	9,237
Differences	61.69%	63.10%	30.47%	36.04%
t-statistics	(4.53)***	(4.67)***	(3.74)***	(4.25)***

Note: Both per capita GDP and per capita income are in constant price.

* p < .1; ** p < .05; *** p < .01

Table 3. Environmental Governance Capacity of Economically Less and Better Developed Regions

	Government capacity		Business capacity	
	1998	2005	1998	2005
National mean	60.10	61.18	59.73	59.84
Mean (better developed)	61.62	62.60	61.85	60.80
Mean (less developed)	59.34	60.51	58.72	59.37
Differences	3.70%	3.35%	5.06%	2.35%
t-statistics	(3.01)**	(2.51)**	(0.87)	(0.40)

p < .1; ** p < .05; *** p < .01

Figure 2. Pollution Discharge (Total Amount) by Economically Less and Better Developed Regions

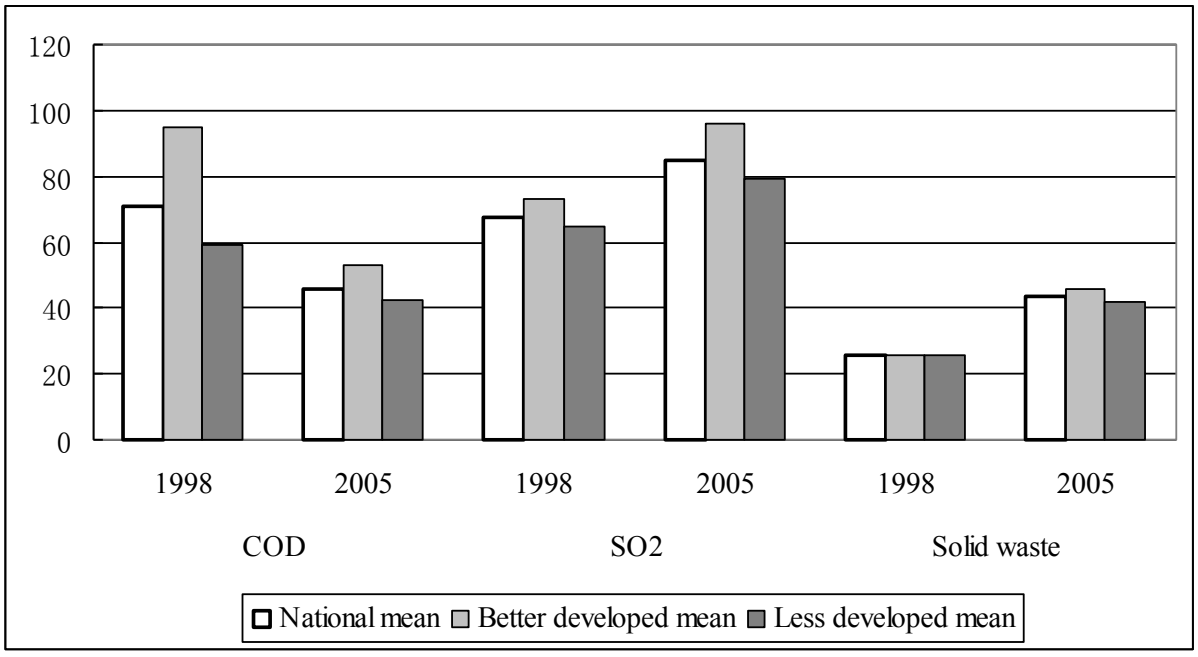

Figure 3. Pollution Intensity in Economically Less and Better Developed Regions

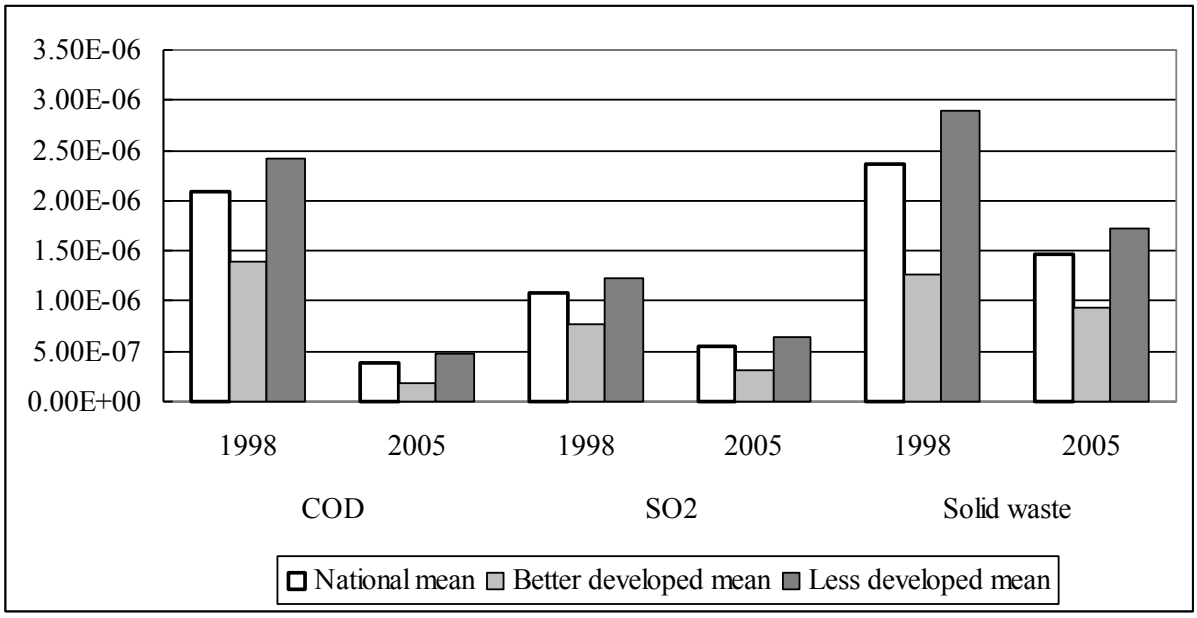

Figure 4. Investment in Pollution Abatement and Control by Economically Less and Better Developed Regions

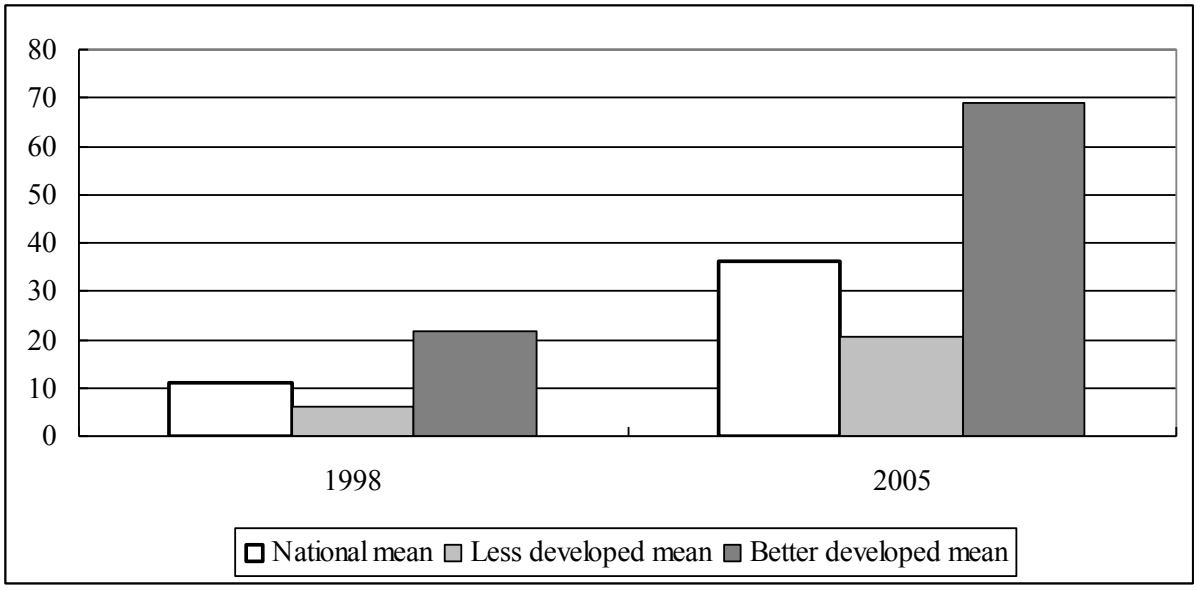

Table 4. Pollution Treatment by Economically Less and Better Developed Regions

	Industrial Wastewater Discharge Meeting Standards (%)		Municipal Wastewater Treated (%)		SO_2 Discharge Treated (%)		Solid Waste Reuse (%)	
	1998	2005	1998	2005	1998	2005	1998	2005
National mean	56	86	14	37	22	39	47	62
Mean (better developed)	69	93	17	55	17	42	71	81
Mean (less developed)	50	83	12	28	25	37	35	53
Differences	27.34%	10.75%	27.50%	49.05%	-43.35%	13.56%	51.05%	34.42%
t-statistics	(3.95)***	(2.22)**	(0.89)	(5.10)***	(0.81)	(0.62)	(4.54)***	(3.29)***

* p < .1; ** p < .05; *** p < .01

Figure 5. Geographical distribution of the National Model Cities for Protecting the Environment in China (1997-2010)