Looking at the Songhua River Incident from An Environmental Regulatory Governance Perspective: A Long Standing Issue in China

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ABSTRACT

The Songhua River incident has highlighted the urgent need to improve the environmental regulatory governance in China. Thus an examination of the current systems, including environmental regulations on paper and institutional apparatus for monitoring and enforcement, is in order. This article finds the comprehensive environmental regulations in China have failed to fully realize their promises due to the weak administrative capacity of local environmental protection bureaus and the limited commitments to protect the environment by local governments. Where is the hope for China's environment then? The author suggests that unless forces from government, industry, and the public are synthesized, China will not be able to strive for a better environment.

INTRODUCTION

Pollution in China had significant negative impact on the economic development, people's daily lives, and the image of China in the international community. Researchers/government officials/the public have attributed the environmental problems to weak enforcement of environmental regulations and policies (see Appendix 1 for details). The most recent water pollution incidents of the Songhua River and the Yellow River revealed the limited capacity of local environmental protection bureaus (EPBs) to regulate industrial environmental behaviors.

The chemical explosion in a plant owned by the China Natural Petroleum Corporation (CNPC) on November 13, 2005 in Jilin caused 5 deaths, more than 70 injuries, and 1 person missing.[1] The wastewater discharged from the explosion and fire extinguishment contaminated the upper reaches of the nearby Songhua River with toxic benzene.[2] Downstream cities, including Songyuan, Harbin, and others had to cut off their running water supply to their residents for a few days. For example, over 4 million people in Harbin did not have running water between November 24 and 27, 2005.[3] It is still unclear what impact the residuals of the toxic benzene in ice would have on the ecosystem of the Songhua River when spring comes. Efforts have been taken to closely monitor the water quality of the Songhua River and to educate the citizens as well as workers of the aquaculture not to catch or eat fish products from the Songhua River.[4]

To quote David Lague, a news reporter of the New York Times, "The Chinese government's decision to cut potentially contaminated supplies of fresh water to a major city highlighted the threat that industrial pollution poses to public health and economic development across the

[1] http://www.eobserver.com.cn/ReadNews.asp?NewsID=15723

[2] New York Times, /2005/11/24/international/asia/24china.html?pagewanted=all; http://www.eobserver.com.cn/ReadNews.asp?NewsID=15723;

[3] http://www.eobserver.com.cn/ReadNews.asp?NewsID=15717; http://env.people.com.cn/GB/1073/3892662.html; http://env.people.com.cn/GB/1073/3893816.html;
http://env.people.com.cn/GB/35525/3894952.html.

[4] http://env.people.com.cn/GB/1073/3892662.html.

nation." [5] Enterprises failed to prevent and treat their pollution under the direction and supervision by local EPBs and the failures had caused tremendous environmental harm to the Chinese society and the neighboring countries. Thus it is urgent to understand and improve the environmental regulatory governance in China.

This article first describes the severe environmental degradation and the comprehensive environmental regulatory system on paper in China. Challenges and issues of environmental monitoring and enforcement follow to make sense of why environmental regulations have failed to realize their full promises. Policy recommendations and directions for future research and actions end this article.

Severe Environmental Degradation

China's environment has become a significant issue both domestically and internationally. In her testimony to the Congress of the United States, Economy (2004) said, "… Yet this (rapid) economic development, coupled with a weak enforcement apparatus for environmental protection, has also resulted in a range of devastating consequences for the environment."[6] The following reasons were identified to justify the Chinese leadership's placing economic development at the top of national development priorities: to provide subsistence for oversized population, industrialize to compete in the global market, and urbanize to raise the qualaity of life.[7] However, the long overlooked environment has revealed to the world problems that can no longer be ignored.

Air and water quality degradation, deforestation, and soil erosion are only a few items on a long list of environmental challenges facing China today.[8] Economy (2004) reported China had 16 of the 20 most polluted cities in the world in 2000.[9] The health damage and economic loss from air pollution is the worst in the world.[10]

The most serious problem facing China probably is access to water. In north China where 46% of the country's population lives, annual water supply is only 770 m3 per capita. Nationwide per capita water supply is about 2300 m3 per year, which is only a quarter of the

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[5] New York Times, /2005/11/24/international/asia/24china.html?pagewanted=all.

[6] Economy, E. (2004). Congressional Testimony: China's Environmental Challenges. Subcommittee on Asia and the Pacific; House International Affairs Committee. Washington, D.C., Council on Foreign Affairs.

[7] Jahiel, A. R. (1997). "The Contradictory Impact of Reform on Environmental Protection in China." The China Quarterly **149**: 81-103.
Palmer, M. (1998). "Environmental Regulation in the People's Republic of China: The Face of Domestic Law." China Quarterly(156, Special Issue: China's Environment): 788-808.
Li, Q. (2001). Chapter 20: Environmental Regulations in China. China Environment and Development Review. Y. Zheng and S. Wang. Beijing, Social Sciences Documentation Publishing House. **1:** 309-321.
Economy, E. (2004). The river runs black : the environmental challenge to China's future. Ithaca, Cornell University Press.

[8] Responding to the severe environmental pollution and natural resources shortage, National Environmental Protection Agency (NEPA) and the State Planning Commission (SPC) jointly proposed China's Environmental Action Plan for 1991 – 2000. This plan highlights the environmental issues that national officials consider particularly significant. Top three problems deal with pollution: water and air pollution and hazardous waste. The second three involve conservation of natural resources: water, land, and forests and grasslands. The final one centers on the balance and integrity of China's ecosystems. Ma, X. and L. Ortolano (2000). Environmental regulation in China : institutions, enforcement, and compliance. Lanham, Rowman & Littlefield.

[9] Economy, E. (2004). The river runs black : the environmental challenge to China's future. Ithaca, Cornell University Press.

[10] With over 300,000 premature deaths per year, China accounts for over 40% of the total for the developing world -- more than twice the number for South Asia, which has a comparable population. This health damage caused an economic loss as big as 4 percent of GDP annually, which is over twice the estimate for India and much higher than losses for other major industrial economies in the developing world. Bolt, K., S. Dasgupta, et al. (2001). "Cleaning the Air in Developing Countries." Forum For Applied Research and Public Policy **16**(3).

world average. China is among the top 13 countries in the world facing a drastic shortage of water resources. Already, about 60 million people in China find it difficult to get enough water for their daily needs. By 2030, the per capita supply is expected to fall from 2200 m3 to below 1700 m3, the World Bank's definition of a water scarce country. During that same period, water demand is expected to jump from 120 billion tons to 400 billion tons annually. Water pollution from various sources (e.g., industrial, domestic, agricultural runoff, etc.) exacerbated the already limited water resources. [11]

Approximately 700 million people drink contaminated water on a daily basis. More than three-quarters of the water flowing through China's urban areas is considered unsuitable for drinking or fishing. Almost one fourth of China's land including one third of the agricultural land is affected by acid rain.[12] If accounting for environmental and ecological loss, the acclaimed over 8% annual GDP growth of China is totally offset by environmental pollution and degradation.[13]

China's State Environmental Protection Administration (SEPA) estimates that industrial pollution accounts for over 70% of the national total.[14] For this reason, SEPA has declared control of industrial pollution to be a top priority for Chinese regulators.

Moreover, as China is under the social transformation accompanied with industrialization and urbanization processes, new environmental challenges have been posed by more mobile and diffuse sources such as motor vehicles and individual households. By 2020, conservative estimates suggest that China will have 110 million cars which will account for over 60% of air pollution in cities.[15] Furthermore, with the urban population increased by 1.86% annually between 1990 and 2000, it was reported municipal wastewater discharge in Chinese cities has been increasing by 5 percent annually.[16] In 2000 municipal wastewater discharge was 22.1 billion tons which outnumbered industrial wastewater discharge by 2.7 billion tons and this gap is expected to increase.[17] However, compared with over 70% of industrial wastewater treated, only less than 20% of municipal wastewater discharge received primary treatment in 2002.[18] In one sentence, China's environment is under stress on almost every front.

Starting from the mid 1970s, after China participated in the 1972 United Nations Conference

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[11] The World Bank (2001). China: Air, Land, and Water. Washington, D.C., The World Bank.
Mulcahy, P. (2003). "Finance and Legal Developments of Environmentally Friendly Wastewater & Pollution." The SinoSphere Journal **6**(2): 24-30.
Economy, E. (2004). Congressional Testimony: China's Environmental Challenges. Subcommittee on Asia and the Pacific; House International Affairs Committee. Washington, D.C., Council on Foreign Affairs.

[12] Economy, E. (2004). Congressional Testimony: China's Environmental Challenges. Subcommittee on Asia and the Pacific; House International Affairs Committee. Washington, D.C., Council on Foreign Affairs.

[13] Quote Economy (2004) "The World Bank reports that the cost of environmental pollution and degradation in China is equivalent to 8-12% of GDP annually." See Economy, E. (2004). Congressional Testimony: China's Environmental Challenges. Subcommittee on Asia and the Pacific; House International Affairs Committee. Washington, D.C., Council on Foreign Affairs; Lei reported a 3.7% GDP loss in 1995, see Lei, M. (2001). Chapter 19: Green GDP. China Environment and Development Review. Y. Zheng and S. Wang. Beijing, Social Sciences Domentation Publishing House. **1:** 297-306.
Economy, E. (2004). Congressional Testimony: China's Environmental Challenges. Subcommittee on Asia and the Pacific; House International Affairs Committee. Washington, D.C., Council on Foreign Affairs.

[14] Industrial pollution discharge accounts for 43% for organic water pollution (COD, or chemical oxygen demand); 81% for sulfur dioxide emissions; and 79% for flue dust (a major component of suspended particulates) in 2001. Source: Environmental Yearbook 2002, China Environmental Protection Administration.

[15] Economy, E. (2004). Congressional Testimony: China's Environmental Challenges. Subcommittee on Asia and the Pacific; House International Affairs Committee. Washington, D.C., Council on Foreign Affairs.

[16] Author calculation based on China Statistical Yearbook 2004. See also at: http://wushuichuli.zj.com.

[17] The World Bank (2001). China: Air, Land, and Water. Washington, D.C., The World Bank.

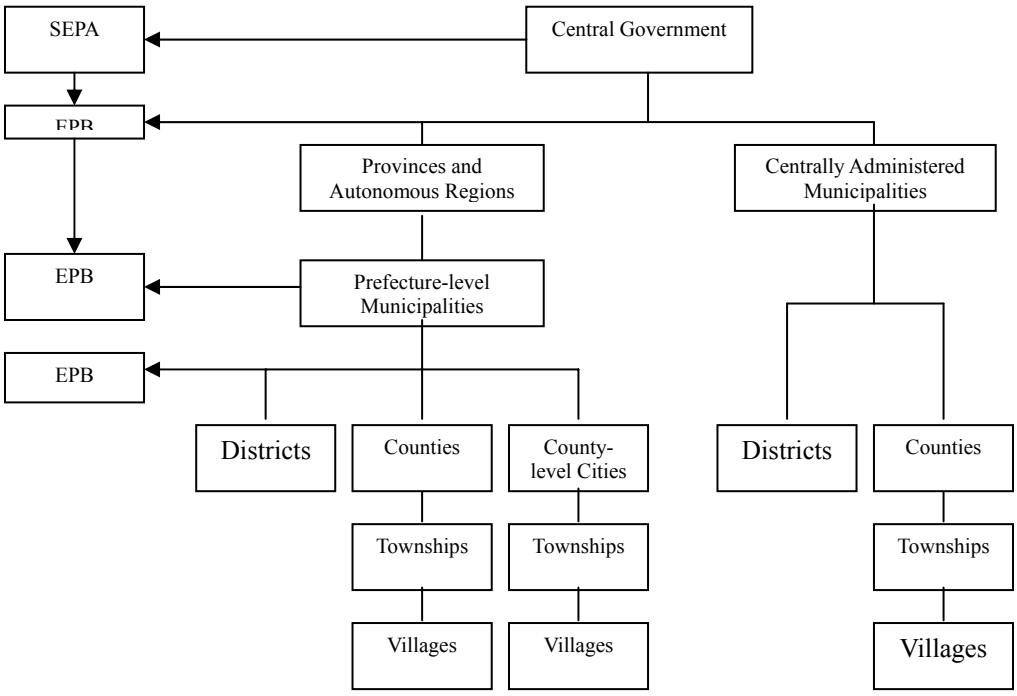
[18] Author calculation based on China Environment Publishing House (2004). China Environmental Yearbook 2004. Beijing.

on Human Environment held in Stockholm, the leadership of China has begun to realize the importance of the environment for economic and social development. During the thirty more years, China has established from scratch comprehensive environmental standards and regulations, built up administrative institutions, trained professionals in environmental policymaking, law enforcement, and scientific research and development, and worked in collaboration with international organizations, intellectuals, and foreign governments to combat environmental problems in China.[19]

Comprehensive Environmental Regulatory System

The architecture of environmental governance in China is of a grid structure. In terms of environmental lawmaking and policymaking, at a central level, both the legislative branch — National People's Congress (NPC) and the administrative branch — the State Council and functional ministries below it could promulgate laws, regulations, and administrative directives. At a local level, People's Congress and local governments of a provincial down to a county level could pass regulations and issue administrative directives as long as they are in line with national regulations (see Figure 1).

Figure 1. Structure of Government Administration in China



[19] Jahiel, A. R. (1998). "The Organization of Environmental Protection in China." China Quarterly(156, Special Issue: China's Environment): 757-787.
Palmer, M. (1998). "Environmental Regulation in the People's Republic of China: The Face of Domestic Law." China Quarterly(156, Special Issue: China's Environment): 788-808.
Morgenstern, R., R. Anderson, et al. (2002). "Demonstrating Emissions Trading in Taiyuan, China."
Economy, E. (2004). The river runs black : the environmental challenge to China's future. Ithaca, Cornell University Press.
Morgenstern, R. D., P. Abeygunawardena, et al. (2004). "Emissions Trading to Improve Air Quality in an Industrial City in the People's Republic of China." RFF Discussion Paper(04-16).
Wang, H., J. Bi, et al. (2004). "Environmental Performance Rating and Disclosure: China's GreenWatch Program." Journal of Environmental Management **71**: 123-133.

To translate regulatory mandates on pollution prevention and control into environmental results, China has employed a web of environmental policy instruments including direct regulation, incentive based and voluntary approaches (see Table 1). Local EPBs are the major parties responsible for policy implementation. Local EPBs depend on local governments of the same level for funding and personnel. But they receive policy mandates from SEPA and higher level EPBs (see Figure 1). As domestic and international observers have correctly pointed out, the sub national structure of the implementation of environmental policies, a dual leadership over local EPBs, and their weak institutional capacity have limited the real impact of environmental regulations and policies.

In terms of environmental regulation, China has a rather advanced system. The Constitution specifies a positive role of the state in protecting the public from pollution and other hazards.[20] Chinese government promulgated its first trial version environmental protection legislation, PRC Environmental Protection Law in 1979. At present, this framework includes roughly twenty-two statutes, more than forty regulations, approximately five hundred standards, and more than six hundred other legal norm-creating documents primarily addressing pollution control, natural resource conservation, and management of the environmental stewardship aspects of consumer products ("product stewardship"). At the local-government level, one senior environmental official indicated that environmental measures at the provincial and municipal levels alone likely total more than one thousand.[21] Of the nationally binding statues, there are five on media specific pollution prevention and control: air, water, solid waste, noise, and maritime environment; twelve on natural resources conservation: forestry, mining, fishery, land, water, wild animals, coal, etc.; two on natural disaster prevention and relief: flood and earthquake; and two most recent ones on specific pollution prevention measures: environmental impact assessment and cleaner production (see Appendix 2 for a compilation of environmental regulations in China).[22]

To materialize the standards and environmental regulations in China, SEPA has adopted a comprehensive system of policy instruments to prevent and control pollution (see Table 1). More specifically, there are four major policies aimed at preventing pollution: three simultaneous, environmental impact assessment, cleaner production, and circular economy. Three different types of pollution control instruments have been adopted: direct regulation, incentive mechanisms, and voluntary approaches. Within the category of direct regulation, three policy instruments are included: limited time treatment, discharge permit, and pollution levy/pollution discharge fee. With less government direct intervention, incentive mechanisms motivate government officials and industry people to pursue better environmental results, which are in their self-interests as well. Three incentive mechanisms are at work: economic, informational, and political. More specifically, tradable emissions permit works through calculations of economic gains/losses by polluters. Color rating and disclosing of environmental performance of firms or disclosing important polluting sources align stakeholder interests through making environmental information publicly available. Comprehensive evaluation of city environmental protection,

[20] Article 11 of the 1978 Constitution states: "The state protects the environment and natural resources, and prevents and eliminates pollution and other hazards to the public." Article 26 of the 1982 and 2004 Constitution states: "The state protects and improves the environment in which people live and the ecological environment. It prevents and controls pollution and other public hazards. The state organizes and encourages afforestation and the protection of forests."

[21] Li, Q. (2001). Chapter 20: Environmental Regulations in China. China Environment and Development Review. Y. Zheng and S. Wang. Beijing, Social Sciences Documentation Publishing House. **1:** 309-321.
Ferris, R. J. and H. Zhang (2003). "Reaching out to the Rule of Law: China's Continuing Efforts to Develop An Effective Environmental Law Regime." William and Mary Bill of Rights Journa **11**: 568 - 602.

[22] Li, Q. (2001). Chapter 20: Environmental Regulations in China. China Environment and Development Review. Y. Zheng and S. Wang. Beijing, Social Sciences Documentation Publishing House. **1:** 309-321. Website of the State Environmental Protection Administration: www.sepa.gov.cn.

environmental responsibility system, or environmental protection model city motivates government officials by potential advancements in their political career. Voluntary approaches are relatively less developed in China with only two instruments in the tool kit: naming nationally environmentally friendly enterprises by SEPA and certifying with the ISO 14000 by individual enterprises.

Table 1. Environmental protection policy instruments in China

Category	***Environmental protection policy instruments***
Preventive	Three simultaneous; Environmental impact assessment; Cleaner production; Circular economy.
Direct regulation I (administrative)	Limited time treatment; Discharge permit.
Direct regulation II (economic)	Pollution levy/Pollution discharge fee.
Incentive mechanism I (economic)	Tradable emissions permit.
Incentive mechanism II (information)	Color rating & disclosing of environmental performance of firms; Disclosing important pollution sources.
Incentive mechanisms III (political)	Comprehensive evaluation of city environmental protection; Environmental responsibility system; Environmental protection model city; National model eco-park; Environmental protection model township/village; Eco-village.
Voluntary approaches	Nationally environmental friendly enterprises; ISO14000.

Environmental Monitoring and Enforcement

Although China has adopted a full range of pollution prevention and control policies, regulatory promise has often fallen short of environmental progress in China. Weak monitoring and enforcement of environmental regulations has been recognized as a major reason for unsatisfactory environmental outcomes.[23] One needs to look no further for causes of this shortfall than China's environmental protection bureaus (EPBs) (difang huanbaoju), the agencies chiefly responsible for regulatory enforcement. EPBs, though nominally affiliated with SEPA, are first and foremost subordinate to local governments. As such, they must compete with other

[23] Qu, G. (1991). Environmental Management in China. Beijing, United Nations Environment Programme and China Environmental Science Press.
Sinkule, B. J. and L. Ortolano (1995). Implementing environmental policy in China. Westport, Conn., Praeger.
Ma, X. and L. Ortolano (2000). Environmental regulation in China : institutions, enforcement, and compliance. Lanham, Rowman & Littlefield.
Bell, R. G. (2002). "Institutional Challenges in Environmental Governance: Moving Beyond General Principles to Achieve Concrete Results." RFF Issue Brief(02-12).
Bell, R. G. (2003). Choosing Environmental Policy Instruments in the Real World. OECD Global Forum on Sustainable Development: Emissions Trading/Concerted Action on Tradable Emissions Permits Country Forum, OECD Headquarters, Paris.
Economy, E. (2004). The river runs black : the environmental challenge to China's future. Ithaca, Cornell University Press.

government agencies for funding and influence (see Figure 1). Because local government officials are generally compensated and rewarded for the rate of GDP growth of their jurisdictions, they typically place economic advancement before regulating industry. EPBs frequently lack resources and leverage needed to translate regulatory promise into environmental progress. Regulatory enforcement consequently suffers.

Weak Administrative Capacity of Local EPBs

Assuming good will of local EPB officials, administrative discretion can be good and necessary if they can accurately target "bad guys" especially given local EPBs only have limited regulatory resources. Otherwise, wide administrative discretion introduces capricious government actions, favoritism to special interests, and corruption.[24] In practice, it is widely acknowledged that the administrative capacity of local EPBs is insufficient.[25]

Besides insufficient technology and equipment, the quality and quantity of the human capital owned by local EPBs pose another constraint on accurate monitoring and aggressive enforcement. Provincial average percentages of professional employees of local EPBs are generally low across China in 2002, ranging from the lowest 16.3% in Tibet to the highest 74.7% in Beijing with a national mean of 53.3%. An average local EPB in China employs 13.3 staff members in 2002, with the least of 6.4 in Qinghai and the most of 24.1 in Henan. [26]

Moreover, subordinate to local EPBs, monitoring stations are alike under-funded and lack of competent professional staff. Generally they carry out three types of monitoring tasks: regular monitoring of important pollution sources, commissioned monitoring by industry, and special monitoring facilitating environmental campaigns or taskforce activities. Both regular and special monitoring is tasks assigned by local EPBs and thus monitoring stations do not charge fee for service. Instead, because most industries lack of self-monitoring capacity, sometimes they hire monitoring stations to be able to self-report their pollution discharge to local EPBs. Some monitoring stations prefer contracts from industry to assignments from EPBs because they earn revenue from the former which can supplement their income. However, professional impartiality is sometimes at stake and consequently the accuracy of environmental information is sacrificed.[27]

A significant proportion of pollution is discharged unnoticed. For example, air pollution or wastewater discharge by enterprises of the service sector such as restaurants, hotels, and hospitals have been blind spots to local EPBs or even the public. Small and medium enterprises (SMEs), is a fast growing and significant sector in economy, but there is not much checks on their environmental behavior. This is especially true for SMEs in rural areas.[28]

Overall, the capacity of local EPBs to pick up signals is lacking because of a shortage of administrative stock (financial and human capital, technology and equipment) and sometimes

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[24] Davis, K. C. (1969). Discretionary justice; a preliminary inquiry. Baton Rouge,, Louisiana State University Press.
Lowi, T. J. (1969). The end of liberalism; ideology, policy, and the crisis of public authority. New York,, Norton.
Handler, J. F. (1986). The conditions of discretion : autonomy, community, bureaucracy. New York, Russell Sage Foundation.
Rohr, J. A. (1989). Ethics for bureaucrats : an essay on law and values. New York, M. Dekker.

[25] Interview 06072005-07. Field study by author conducted in August 2005 in Jiangsu Province, China. For example, even in a prefecture level city in Jiangsu Province, one of the most economically advanced regions in China, not until 2004 its EPB had been equipped with mobile monitoring trucks. There were no continuous monitors installed in enterprises which are connected to monitoring stations then.

[26] Author calculation based on China Environmental Yearbook 2003.

[27] Interview 06072005-07; 07182005-01.

[28] There are anecdotal stories on how township and village enterprises have devastating effects on local environment in China. But it is not well documented or analyzed. Gunningham, N. and D. Sinclair (2002). Leaders and Laggards: Next-Generation Environmental Regulation. Sheffield, Greenleaf Publishing Limited. In this book Gunningham and Sinclair analyzed environmental regulatory enforcement challenges posed by SMEs in well developed countries.

conflict of interests. To cope with, local EPBs have adopted a targeted enforcement strategy following up on citizen complaints. Unfortunately, the enforcement is sometimes biased because citizens usually do not have the technical knowledge to assess environmental harm and risks and regulatory resources tend to be allocated more to issues which are more visible.[29]

Weak Enforcement of Environmental Policies

Even when EPB officials have identified right target for aggressive enforcement, taking actions against polluters is sometimes impeded by local governments.[30] Local governments generally show special leniency toward big contributor to local tax revenue, or big employers or enterprises in financial hardships within their jurisdiction even if they violate environmental standards or regulations. Jahiel (1997) reported local governments sometimes will reduce or waive water pollution discharge fees based on economic considerations.[31] Economy (2004) and Chen and Uitto (2002) reported sometimes local governments even help their enterprises circumvent environmental regulations.[32] Even worse, sometimes local governments will hold back information on poor environmental performance of enterprises within their jurisdiction. For example, in Hohhot, Inner Mongolia and Tongling, Anhui Province, city governments would not let their EPBs to make public the color rating results of some big polluting enterprises in their core industries. [33]

So in China, it is unrealistic to assume local governments and their EPBs share the same utility function and pursue the same policy goals regarding environment protection. More commonly, their interests divert. Thus enforcement officers of local EPBs face a difficult task: they have not only to negotiate with polluters but also to work hard to gain support from local governments before taking an enforcement action.

Besides the institutional constraints on local EPBs, an instrumental view towards the environment by the leadership permeates Chinese government at all levels across time. This might be a root cause of why environmental protection is perceived to be in rivalry with other development goals. During Mao Zedong's leadership in 1950s and 1960s, according to China scholar Rhoads Murphey, Mao's conception of nature is: "Nature is explicitly seen as an enemy, against which man must fight an unending war, with more conviction and fervor and with a brighter vision of the ultimate results than even the Darwinian-Spencerian West held."[34] The belief of environment being at full disposal of the human held by Chinese leaders gives a subordinate status to the environment. This has been used to justify campaigns against the nature.

Fortunately, in the past a few years we have seen rising public environmental awareness and change in the attitude toward the environment of the top leadership in China. Measures have been employed to mainstream the environment in development decision-making from top-down. Sustainable development and a harmonious society which infers a harmony between the human

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[29] Wang, H. and D. Wheeler (2000). Endogenous Enforcement and Effectiveness of China's Pollution Levy System. Policy Research Working Paper 2336. Washington, D.C., The World Bank.
Wang, H., N. Maningi, et al. (2003). "Incomplete Enforcement of Pollution Regulation: Bargaining Power of Chinese Factories." Environmental and Resource Economics **24**: 245-262.

[30] Interview 06072005-06; 06082005-04; 06092005-01; 07152005-01; 07172005-01. Jahiel, A. R. (1997). "The Contradictory Impact of Reform on Environmental Protection in China." The China Quarterly **149**: 81-103.

[31] Ibid.

[32] Economy, E. (1997). Environmental Scarcities, State Capacity, Civil Violence: The Case of China. Washington, D.C., American Academy of Arts and Sciences.
Chen, S. and J. I. Uitto (2002). "Governing Marine and Coastal Environment in China: Building Local Government Capacity Through International Cooperation." China Environment Series **6**: 67-80.

[33] Interview 06022005-01; 06022005-02; 07152005-01; 07152005-02; 07172005-01; 07182005-02.

[34] Feuerwerker, Albert; Murphey, Rhoads ; & Wright, Mary. (1967). Approaches to modern Chinese history. Berkeley,, University of California Press.

and the nature have become national development goals.[35] Specific measures taken include the accounting of environmental and ecological losses to come up with a green GDP by the State Bureau of Statistics and SEPA of China, to assess the environmental impact of development plans, and to include environmental indicators in the evaluation and reward systems of the government officials.[36]

Toward an Effective Environmental Regulatory Governance System: Conclusions and Policy Recommendations

Environmental protection and economic development are in competition for the attention of the leadership of local governments. Given the level of the openness of an economy and the level of socioeconomic development of a region, the commitment to environmental protection by local leaderships can be shaped by the evaluation and reward system of government officials in a broader context. For example, the budget of the Zhenjiang monitoring station increased by two-fold between 2002 and 2004 because Zhenjiang city government wanted to become an environmental protection model city in China in 2002.

Besides government, individual citizens can also play an important role in environmental monitoring and enforcement. Environmental information disclosure introduces the public into the government-industry enforcement dyad to make up for insufficient government resources in environmental monitoring and enforcement and opens up the possibility for private enforcement. As the venue for private enforcement is mainly public complaints, citizen lawsuits, or vote by feet in the consumer product and/or the capital markets, China has not yet had the necessary institutional infrastructure. Public interest groups or public interest lawsuits are not encouraged in China. A public interest organization is required to have a sponsor which is either a public organization or a government agency. The requirement has curbed the growth of the NGO sector in China. Public interest lawsuits are sometimes impractical because according to the General Principles of Civil Code, for example, natural persons do not have a legal standing to bring lawsuits on behalf of the polluted environment, such as the Songhua River.[37]

In the meantime, similar to other developing countries, China does not have a well developed NGO sector and mechanisms for attorney fee recovery. It is difficult for the public to take legal actions against pollution. It is rather exceptional that the Center for Legal Assistance to Pollution Victims (CLAPV) of China University of Political Science & Law has been helping pollution victims bring law suits to courts since it was established in 1998. The CLAPV has to attract funding from oversea to be able to sustain itself because it provides legal service to

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[35] In September 2004, President Hu, Jintao set the national development goal for China is to construct a "harmonious society." For more information about president Hu's speech, check the link at http://www.xf.people.com.cn/GB/42468/3202830.html
In September 1995, President Jiang, Zemin set the national development goal for China is to pursue a sustainable development path. For more information about president Jiang's speech, check the link at http://www.people.com.cn/GB/shizheng/252/5089/5106/5181/20010430/456597.html

[36] For more information about the work on Green GDP in China, check the link at http://www.sepa.gov.cn/eic/649096689457561600/20040914/1683.shtml;
For more information about the UNEP integrated environmental and economic accounting, check the link at http://unstats.un.org/unsd/envAccounting/seea.htm;
For more information about the national environmental protection model city, check the link at http://www.sepa.gov.cn/eic/650501865317859328/index.shtml;
For more information about the environmental assessment of development plans, check the link at http://www.sepa.gov.cn/eic/651340792689852416/index.shtml.

[37] On December 7, 2005, three professors and graduate students of Peking University brought a lawsuit to the Supreme Court of Heilongjiang Province on behalf of three natural beings in Songhua River. However, the Supreme Court of Heilongjiang Province rejected to file this lawsuit.

pollution victims free of charge.[38]

Finally, since there are currently less than 2000 publicly traded companies in the whole country, investors can only potentially exert pressure on a very limited amount of firms. Although customer pressure might compel producers to take into consideration the life-cycle environmental impact of their products, customers in China are not sophisticated enough or willing to favor "green" products or producers.[39] By this standard, the majority of polluters in China are left unattended by both the government and the public. Then, how to improve the environmental regulatory governance system in China?

Policy Recommendations

China needs to construct better institutional infrastructure which reconciles the goals of economic development and environmental protection.

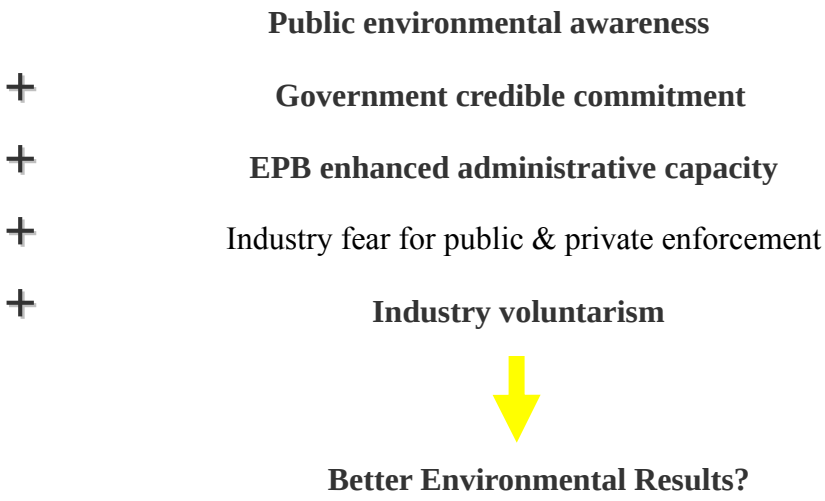
- To include social and environmental indicators in the evaluation and reward system of government officials then they will look beyond the rate of the GDP growth and will be able to better pursue sustainable development.
- To encourage the NGO sector to grow, then a strong civil society can check on decisions on environmental matters by the government.
- To reform the legal system, then public interest lawsuits can be brought to the court.
- To enhance the administrative capacity of local EPBs especially EPBs of less developed regions as polluting industries are migrating from better developed to less developed regions in China.
- To establish public environmental education/communication programs on EPID, then public dialogues on EPID can be built to walk the government, industry, and the public farther along the following six steps: awareness, interest, knowledge, attitude, legitimization, and practice.
- To increase the stringency of environmental enforcement then noncompliance becomes more expensive and the EPID programs can have better deterrence effect on polluters.

Figure 2 illustrates how administrative, legal, public, and industrial forces converge to achieve better environmental results. The "visible emissions" program in the US is a good example of how the forces have converged. It is worth experimenting with the "visible emissions" in a Chinese context to see how the government could walk the public from awareness to participation in environmental monitoring and enforcement in a meaningful way.

[38] Interview with the director of the CLAPV, Canfa Wang.

[39] Seventy-five percent of the public won't consider environmental factors when making purchasing decisions. About 65 percent of the public was not willing to pay more for environmentally friendly products. Personal conversation with Lois Schiffer, the Assistant Attorney General of the Justice Department's Environment and Natural Resources Division. She does not think consumer markets can reward and/or punish firms based on their environmental performance. Her point is echoed by Eisner, Marc Allen. (2004). "Corporate Environmentalism, Regulatory Reform, and Industry Self-Regulation: Toward Genuine Regulatory Reinvention in the United States." Governance 17(2): 145-167. "Research by Roper Starch Worldwide (see Speer 1997) reveals that the average eco-premium is approximately 4.5 percent in the US. Environmental impact is the primary decision criteria for 6 percent of the population — well behind experience (47%), price (37%), brand recognition (15%), personal recommendation (13%), and convenience (12%)."

Figure 2. Administrative, Legal, Public, and Industrial Forces Converge to Achieve Better Environmental Results



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APPENDIX 1. PUBLIC PERCEPTION OF ENVIRONMENTAL CHALLENGES FACING CHINA

Has the Government Done a Good Job in the Following Measures?

	Good	*Bad*	*Do not know*
Writing environmental regulations	37.8	31.6	30.6
Public environmental awareness and education programs	38.1	27.2	24.9
Investment in environmental protection	44.6	27.0	28.4
More stringent enforcement	37.3	24.3	38.4
Facilitate the public to participate in environmental matters	40.2	22.7	37.1
Compel industry to comply	37.8	19.7	42.5
Better technology for solving environmental problems	38.7	18.9	42.4
Mobilize social organizations	36.7	17.5	45.9

Source: (Yang, Ming, 2002), Chart C5, P.278.

Which of the Following is the Most Urgent Task to Carry Out?

	Government official*	Entrepreneur*	The public**
More stringent enforcement	36.2	21.6	13.6
More investment in environmental protection	16.3	24.4	15.1
Compel industry to comply	12.6	11.3	9.7
Enact more environmental regulations	12	12.4	18.1
Facilitate the public to participate in environmental matters	9.3	10.6	10.6
More public environmental awareness and education programs	7.4	9.3	23.7
Better technology for solving environmental problems	4.5	9	5.4
Mobilize social organizations	1.7	1.3	3.8

Source: (Yang, Ming, 2002), * Chart 4.2.4-1, P.223; ** Chart C5, P.278.

APPENDIX 2. ENVIRONMENTAL REGULATIONS IN CHINA

Year	*Regulations on Pollution Prevention and Control*
1979	PRC Environmental Protection Law (amended 1989)
1982	Marine Environmental Protection Law (amended 1999)
1982	Collection of Pollution Discharge Fees
1984	Water Pollution Prevention and Control Law (amended 1996)
1987	Air Pollution Prevention and Control Law (amended 1995, 2000)
	Solid Waste Pollution Prevention and Control Law (amended 1995)
1995	Provisional Regulations on Huai River Basin Water Pollution Prevention and Control
1996	Environmental Noise Pollution Control Law
2002	Environmental Impact Assessment Law
2002	Cleaner Production Promotion Law
2003	Ordinances on Collecting and Managing Pollution Discharge Fee
	Regulations on Natural Resources and Ecosystem Integrity
1984	Forestry Law (amended, 1998)
1986	Grasslands Law
1986	Land Administration Law (amended, 1998)
1986	Fisheries Law
1986	Mineral Resource Law (amended 1996)
1988	Wildlife Protection Law
1988	Water Law (amended 2002)
1991	Water and Soil Conservation Law
1993	Water and Soil Conservation Law Implementation Regulations
1994	National Park Regulations
1996	Natural Flora Protection Regulations
1997	The Energy Conservation Law
1997	The Flood Prevention Law
2001	Law on Desertification Prevention