

INTRODUCTION

Objectives, Significance and Structure of the Paper

Improving water quality in the Huai River Basin (HRB) is one of China's top environmental priorities in the twenty first century. Ambitious goals have been set in the 10th Environmental Protection Plan for HRB's water quality management. However, ineffective management institutions and instruments hinder the significant progress toward those lofty goals. The situation demands urgent reforms to remove the barriers to the achievement of the goals. Hence, the objectives of this paper are threefold:

- To introduce a new institutional design and analysis tool, namely the Appreciated, Influenceable and Controlled institutional environment analysis methodology (hereinafter referred to as the AIC methodology), to the target readers and to demonstrate its application in the case of HRB water quality management;
- To identify the problems with current HRB water quality management institutions and instruments by using the AIC methodology; and
- To offer practical policy recommendations, on the basis of the diagnosis, to reform the current management institutions and instruments, with the hope to enhance their effectiveness in managing the water environment in the HRB.

In addition to the substantive contribution, this paper also represents the first effort to apply the AIC methodology to the examination of unified management and the pollution levy system in the HRB. Although these topics have been studied by many other researchers before, this paper renders new insights into the subject matters by presenting a more comprehensive

picture that joins the fragmented findings from many previous studies under the AIC framework. This approach will contribute to the understanding of how to create more favorable institutional environments for the management of HRB water quality. Furthermore, the HRB shares many common features with all other major river basins in China. Another advantage of using the AIC methodology, therefore, is that it makes the lessons from the HRB, especially the analyses and reform recommendations in the appreciated and influenceable environments, generalizable and beneficial to all major river basins in China.

This paper consists of two parallel case studies. The first one focuses on the issue of “unified management”. It investigates the existing basin-level management institutions and seeks ways to strengthen their roles in the unified management of the HRB water quality. The other case study examines the water pollution levy system (a market based incentive) and local environmental protection bureaus (EPBs), which are its implementing agencies. It analyzes the defects both in the system itself and with the implementing agencies and offers recommendations to improve the performance of the levy system. Both cases start with a brief introduction of the background of the subject. Then, the AIC methodology will be applied to diagnose problems in all three levels of the institutional environment that contribute to the lack of effectiveness of the institutions under study. The diagnosis is followed by practical policy recommendations on measures to be taken and principles to be abided by in order to improve the performance of the institutions in water quality management in the HRB. Finally, the conclusion discusses the broader implications of this paper in China.

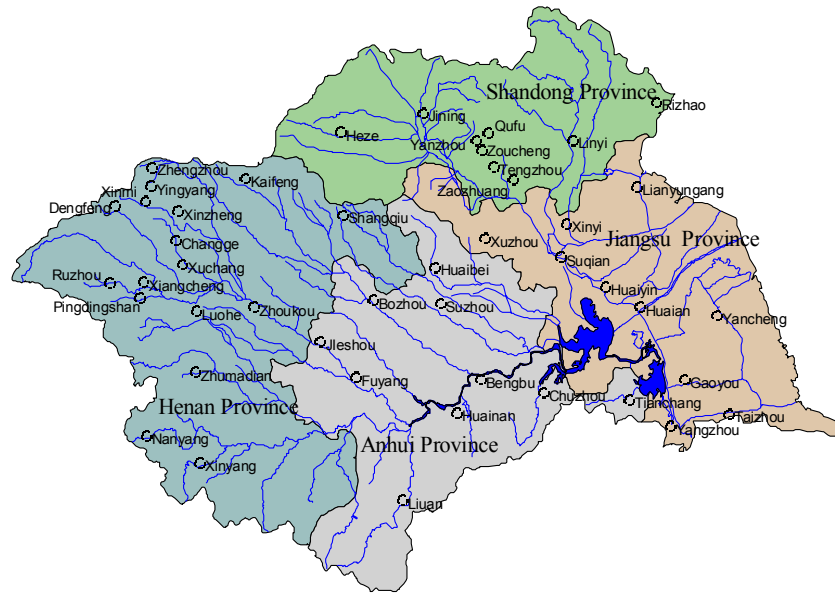
Background: Huai River Basin and Its Water Related Problems

Huai River is one of the 7 major river systems in China. It is located in the center of East China and has long been considered the dividing line between the North and South China. It stretches across 4 provinces, which are, from upstream to downstream, Henan, Anhui, Shangdong and Jiangsu. With a total drainage area of 269,000 km², the Huai River Basin (HRB) supports the livelihood of more than 165 million people and nurtures some key commodity grain production bases in China with its fertile plains (HRC, 2003). It also connects two of China's most important river basins – also known as the cradles of the Chinese Civilization – Yangtze and Yellow River basins. Figure 1 shows the location of the HRB in China and Figure 2 illustrates the geographic features of the basin in greater details.

Figure 1: Location of the HRB in China



Figure 2: Map of the Huai River Basin

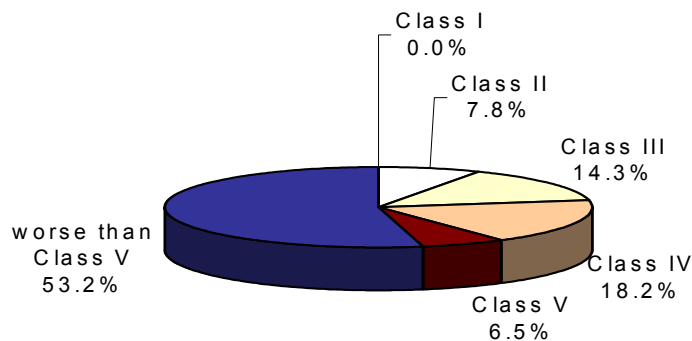


Two water related problems stand out in the Huai River watershed. One is severe water shortage. The availability of water resource per capita is only 505 m^3 in the region, far less than the national average of 2343 m^3 , making the Huai River basin the second most water scarce watershed in China (World Bank, 2001). Rapid regional economic development has not only accelerated the exhaustion of an already limited water resource, but has also escalated the competition for water use among agricultural, industrial and municipal users. In recent years, ecological demand for water, a traditionally overlooked water use, has also received more attention. Ecological demand for water describes the minimum quantity and flow of water necessary to support a sustainable riverine ecosystem. The addition of such a consideration further complicates and exacerbates the situation.

The other problem in the HRB is serious water pollution. Large quantities of industrial, agricultural and residential pollution enter Huai River every year and severely degrade its water

quality. According to the Report of the State of the Environment in China (SEPA, 2002), among the 77 monitored sections on Huai River's mainstream and major tributaries, close to 60% were classified Grade V or worse in terms of Chinese surface water quality standards¹. A breakdown of water quality classification of the monitored river sections is illustrated in Figure 3.

Figure 3: Water Quality Classification of Huai River Sections (2001)



The water quantity and quality problems exacerbate each other and form a vicious cycle that threatens the health of local residents and sustainable long-term regional development. In light of the magnitude and urgency of these problems, especially the latter, the central and riparian governments have attached great significance to Huai River pollution prevention and control and have made many efforts in the past decade to mitigate the problem. The State Council designated Huai River as one of the three national rivers that must receive immediate and thorough treatment. HRB pollution control and treatment remained an environmental priority in the 10th Five Year Environmental Plan (SEPA, 2001).

¹ In China's classification of water quality, Grade I and II means good quality, Grade III and IV are fair and Grad V or worse represent very poor water quality.

METHODOLOGY

The AIC institutional analysis and design methodology was developed by Smith, Lethem and Thoolen (1981) initially for the purpose of improving the World Bank's rural development programs². The methodology derived its name from the three levels of institutional environment it presumed to be critical to the smooth functioning and successful operation of an institution, which are, in the order of controllability by the focal institution, from the most to the least:

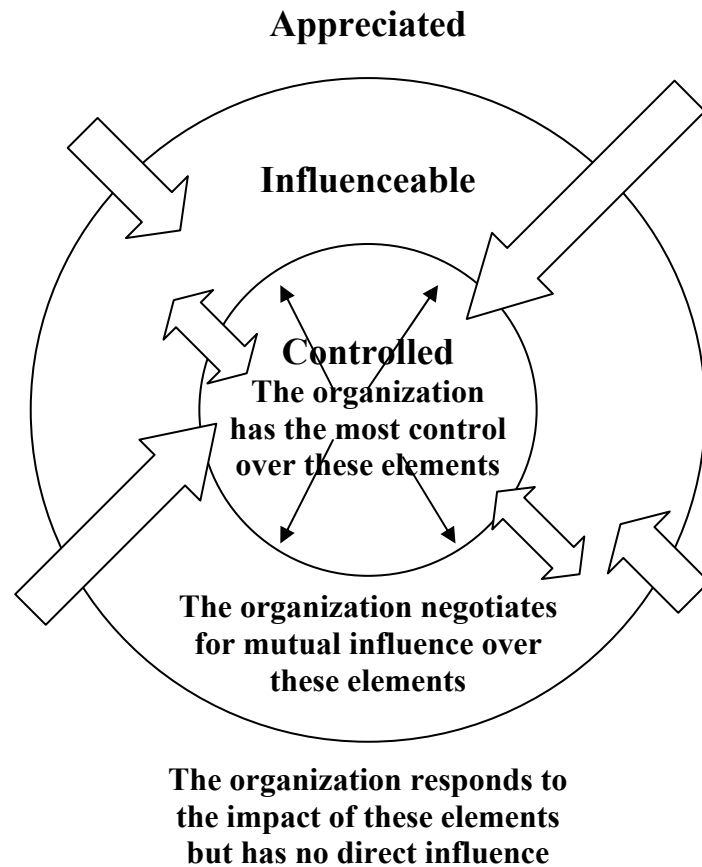
- **Controlled environment:** This is the environment on which most traditional institutional theories focus. It is defined by the institution's own administrative boundary. It consists of the activities and arrangements necessary to maintain the daily operation and produce the intended results in an institution. Examples of the elements in this environment include organizational structure, appointment of staff, operational plans and specific projects undertaken in the focal institution.
- **Influenceable environment:** This is the first level of the external environment to an institution. This environment is located in proximity with the focal institution and therefore maintains ongoing relationships with it. Because of the frequent interaction, the entities in this environment are within the sphere of influence of an institution and reciprocally exert influences on the organizational and management performance of the institution. For a productive enterprise, typical actors found in its influenceable environment include at least governmental agencies, banks, its supplier and customers, and its competitors.

² This section is based in part on the class notes for PPS 325 on AIC Institutional Design theory taught by Professor Francis Lethem at Duke's Sanford Public Policy Institute.

- **Appreciated environment:** This is the second level of the external environment to an institution that extends beyond its sphere of influence. Although it is neither under the control nor direct influence by the focal institution, it affects the performance of the institution to various degrees. This requires the focal institution to acknowledge, appreciate and adjust to such an environment in order to achieve success. In most cases, the appreciated environment comprises of national policies, people at large, culture, legal institutions, state of technological advancement among others.

The interrelationship between the appreciated, influenceable and controlled environments of an institution is graphically captured in the following figure.

Figure 4: An organization's relations to its environments (Smith, Lethem and Thoolen, 1981)



This methodology of institutional analysis and design departs from the traditional “machinery perception” of institutions. Possibly being the legacy of the “Machine Age”, the latter view assumed a simple extrapolation of the mechanical structure of machineries (which are often certain, measurable and static) to human institutions and societies. Under such a view, the improvement of institutional “functioning” is a matter of “internal affairs” or “finding the right structure”, but the AIC model is more dynamic. Relationship, influence and participation are the key concepts in this model. It seeks solutions to institutional dysfunction outside of the institutional boundaries. The AIC methodology pays particular attention to the following elements in each of the three institutional environments:

- Appreciated environment: Identification of stakeholders; participation of stakeholders in institutional decision making processes; and agreement on common purposes and a vision of the desirable outcome among the stakeholders.
- Influenceable environment: The cooperation and coordination between the focal institution and other stakeholders and incentive mechanisms.
- Controlled environment: Internal structural arrangement and institutional capacity.

These elements will be comprehensively analyzed in the two case studies.

CASE STUDY I: STRENGTHENING THE UNIFIED MANAGEMENT OF THE HUAI RIVER BASIN TO BETTER MANAGE WATER QUALITY

Background

Chinese central government, through both domestic and foreign water management experiences, has been increasingly aware of the importance of the ‘unified management’ of a river basin. The concept of ‘unified management’ treats the entire river basin as one management unit and calls for closer cooperation and coordination in planning and administration among different levels of governments and line ministries. This concept is explicitly recognized in several of China’s water-related statutes³. A number of coordination mechanisms were established to facilitate the implementation of such a concept. In the HRB, there exist three institutions managing at the basin level: The Huai River Commission (HRC), the Huai River Water Resource Protection Bureau (HRWRPB or the Bureau) and the Leading Group on Water Resource Protection of Huai River Basin (the Leading Group or LG).

Despite the establishment of these institutions, improvement in cooperation and coordination among line ministries, among riparian governments and between the two remains disappointing. The following analysis aims at identifying the impediments to the “unified management” by using the AIC methodology and offering policy recommendations to remove or reduce the impediments to realize the objective of “unified management”. The unit of analysis will be the three existing HRB management institutions.

³ See the next section for details.

Diagnosis of the Problems Using the AIC Methodology

Appreciated environment

The legal basis for water quality management in China and corresponding administrative arrangement for the purpose was laid out in three national statutes: the Environmental Pollution Law of the People's Republic of China, Law of the People's Republic of China on Water Pollution Prevention and Control (hereafter referred to as the Water Pollution Law or WPL) and the Water Law (hereafter referred to as WL). In the latter two laws, the principle of unified planning at the basin level was explicitly recognized⁴. However, WPL and WL have two different yet related focuses: WPL was enacted to prevent and control water pollution or to protect water *environment*, whereas WL's main purpose is to manage water resources utilization and development or to protect water *resources*. The WPL authorizes SEPA to be the leading agency to perform unified supervision and administration of water *environment* protection, while the WL empowers the MWR to perform the equivalent task for water *resource* protection. Each law requires other relevant ministries, within their scopes of duty and administrative function, to work 'in coordination' or 'in conjunction' with the leading agency it designates in the water environment protection (the WPL) or water resources protection (the WL)⁵. Yet, to add to the confusion, the legal definition of water '*environment*' in the WPL and water '*resources*' in the

⁴ Article 10 of WPL reads 'To prevent and control water pollution, it is necessary to make unified plans on the basis of river basins or regions...' and Article 11 of WL quotes 'The development and utilization of water resources as well as the prevention and control of water disasters shall be planned in a unified way on the basis of river basins or regions...' The contents of the two laws can be viewed at the SEPA website <<http://www.zhb.gov.cn/english/2-regulations.php3>>

⁵ Articles 4 and 9 in WPL and WL.

WL does not make a clear distinction between the two terms. Such ambiguity gives rise to many problems.

The Huai River Basin (HRB) is a microcosm that demonstrates the complexity of current water quality administrative framework in China. At the State level, SEPA, the MWR, Ministry of Agriculture (MoA), Ministry of Forestry, Ministry of Construction, and planning agencies, such as Ministry of Finance (MoF), State Economic and Trade Commission (SETC) and State Development Planning Commission (SDPC), are all involved in HRB management. At the local level, the institutional setting for water environmental management resembles the pattern at the State level, with Environmental Protection Bureaus (EPBs) of each riparian province exercising unified management within their respective jurisdiction in coordination with other relevant governmental agencies.

Despite the legal stipulation for unified planning and administration, which entails close coordination and cooperation, the current administrative framework is characterized by fragmentation. Each department focuses narrowly on its own mandates and pursues its own interests, even to the point of interfering with others' work (Wang, 2000). Among line ministries, the lack of coordination is the most apparent between SEPA and the MWR. The unclear division of responsibilities between them, as well as their quest for visibility and political credits result in competition for work, duplication of responsibilities, overlap of authorities and crevices in management. In water quality monitoring, for example, each agency maintains its own monitoring stations that use different standards for evaluating water quality and publishes its monitoring results via different channels. Sometimes, the published results for the same river segment during the same period are contradictory (World Bank, 2001). Among riparian

governments, since the Water Law and Water Pollution Law delegates them the authority over their own jurisdictions, each province has already established a system of water quality management within its own administrative boundary. Provincial regulations regarding Huai River have been made and enforced locally. There is very little interjurisdictional coordination and cooperation.

It is under this broad enabling environment that Huai River basin wide management institutions were established to facilitate unified management and promote coordination. Despite all the good intentions, the design of such institutions did not take into account stakeholder analysis and was not built on common purposes. Without such common purposes among key stakeholders, they will simply follow the rules for the sake of following the rules, and coordination takes place only in form, but not in spirit.

First, the principle of “unified management” for pollution control may be a new concept for many local officials in the watershed, which requires them to turn away from their habitual mindset in a rigid, hierarchical and controlled bureaucratic environment. Incentives to coordinate and cooperate in “unified management” are also lacking because these officials’ chances of climbing up the bureaucratic ladder are usually linked directly to their performance and achievement within their own jurisdiction. In addition, there is an insufficient realization of the benefits and necessity of managing water quality in a river basin in a unified and coordinated manner. In other words, even though “unified management” is written in the laws, it has not been fully appreciated by all stakeholders in HRB management. This relates to the problem of lacking legitimacy or ‘felt demand’ for coordination among stakeholders.

Second, the goals set in the 10th Five-Year Environmental Plan for Huai river water pollution prevention and control were overly ambitious. It was made largely in a top down way with very little consultation and input from governments at lower levels and the public. Given the already serious deterioration of water quality in Huai River, reaching those goals in the designated time frame is an enormous task for some localities. Therefore, it is hard to know if all local governments really consider Huai River water pollution control a priority, especially those in relatively economically backward provinces such as Anhui and Henan. This may also contribute to the lack of common purposes and hinder cooperation.

Finally, the stakeholders in the HRB should include not only governmental institutions, but also people in the watershed who will be most affected by the policies and benefited from water quality improvement. However, in China's highly centralized political decision-making processes, little attention was paid to public opinion. Article 3 of the Water Law proclaims: "Water resources shall be owned by the state, that is, by the whole people"⁶. Lack of environmental awareness and perception of environmental protection as largely a governmental responsibility among people may underlie the public's weak demand for a more coordinated management of the HRB.

Influenceable environment

The creation of HRB management institutions dates back to the 1950's, when the then Huai River Basin Management Committee was established as one of seven such committees in China's major river basins. Its function was mainly flood control, transportation management

⁶ Article 3 of WL viewed from SEPA website <<http://www.zhb.gov.cn/english/2-regulations.php3>>

and water conservancy project construction. After several transformations, the Committee is now named the Huai River Commission (HRC) under the direct leadership of the MWR and is responsible for the unified management of water resources in HRB on behalf of MWR. In the wake of severe environmental degradation in the watershed, the Huai River Water Resources Protection Bureau (HRWRPB or the Bureau) was established in 1975 under the leadership of then Ministry of Water Conservancy and Electric Power (the MWR today). After the foundation of the National Environmental Protection Bureau (now SEPA), the HRWRPB was subject to the dual leadership of both SEPA and the MWR. In 1989, the Leading Group on Water Resources Protection in Huai River Basin (the Leading Group or LG) was formed. However, its role was not made official until 1995, when a groundbreaking State Council regulation, ‘the Provisional Regulation on Huai River Basin Water Pollution Control’, formally established its status to coordinate water resources and environmental protection and resolve major issues in the HRB. This regulation was the first of its kind (regulation governing an entire river basin) in China. The LG is co-led by SEPA and the MWR and its office is housed in the Bureau.

These institutions’ role as ‘unified management’ agencies determines that they must work primarily with their influenceable environment. However, their influence power does not seem to be proportionate to their responsibilities.

The most influential of the three, the Leading Group, does not perform everyday operations. In fact, periodic meeting is the main form of coordination for the LG. During a typical LG meeting, work of the previous stage is summarized and that for the next stage is planned. LG members, which now include representatives from the four riparian provinces, SEPA, MWR, SDPC, SETC, MoF, MoA, Ministry of Construction, People’s Bank of China and

Chinese Development Bank, also hear reports, discuss basin water pollution control targets and measures and approve them. According to the World Bank Draft Project Report (2002), there have been only 7 such meetings since 1990. The report further pointed out that SEPA actually preferred another form of organization, namely the Joint Meeting System, because that would give it sole leadership. This to some extent illustrates the competition (sometimes even friction) between SEPA and the MWR in managing HRB water quality discussed in the Appreciated environment stage. With infrequent meetings and low commitment of the key players, the LG does not seem to be able to exert much real influence.

The HRC and Bureau maintain daily operation; however, their influence is at best marginal due to the following limitations:

- Institutional location: Both the HRC and Bureau are under the leadership of the MWR. Although the Bureau is also subject to SEPA leadership in name, in reality the decision on its personnel and budget is under the control of the MWR. Their location compromises their legitimacy to coordinate on water environmental protection issues.
- Administrative classification: Both institutions are classified per the Chinese administrative system as public affair institutions with very limited administrative power. In essence, they are at the bottom of China's bureaucratic pyramid. Their voice is easily lost in the myriad of higher bureaucracies.
- Staff motivation on water pollution control: Given their historic evolution, these two institutions have a strong emphasis on water resources development, utilization, flood control and hydro-project construction and their staffs have more experience in these fields. Water quality management as a more recently added mandate, combined with

their relative lack of expertise in the field, may give them less incentive to deal with water quality problems.

Controlled environment

HRC's internal institutional arrangement consists of one administrative office, several divisions responsible for water resources management, construction, flood and drought resistance and water conservation respectively, a few operational offices for budget and personnel management and many affiliated hydropower enterprises and water quality research/measurement institutions. Its daily duties involve supervision of the implementation of the Water Law in HRB, resolution of interprovincial water conflicts, preparation of regional water management plans, flood resistance and water conservancy project construction, and many others (HRC, 2003).

The Bureau's main functions are six-fold: publication, planning, supervision, management, environmental quality monitoring and research. It is also required to report environmental monitoring data and research findings to the LG. For all previously discussed reasons, neither institution has realized its full potential or fulfilled the real intent of its establishment.

Diagnosis

The above analysis of the three levels of institutional environment reveal that the causes behind the inefficiency and ineffectiveness of HRB management institutions lie primarily in their appreciated and influenceable environments, and not so much in their controlled environment. I offer the following diagnoses:

- In the appreciated environment, the ambiguity in water laws incites bureaucratic infighting for visibility and ‘control’ over HRB management between the two leading agencies, which lowers the incentive to cooperate and coordinate and undermines the basis for “unified management”. There is also a general lack of common purposes and “felt demand” (due to unawareness of the benefits and necessity) among riparian governments for water quality management goals and ‘unified management’ of HRB water quality.
- In the influenceable environment, the ability of these institutions to exercise “unified management” hinges upon their influence power, which is very limited in the current institutional setting.
- In summary, the main problem with HRB management institutional design seems to be rushing into the controlled stage by establishing an institution without regards to the enabling environment, especially the needs of all stakeholders and demand for such an institution.

Recommendations for Improvement and Proposal for a Better Future Design

Recommendations based on above diagnoses

As it currently stands, the LG should have the greatest potential to step forward and promote coordination and “unified management” in the HRB because of its current construction (participation from almost all stakeholders) and statutory delegation of such power (in both national water laws and Huai River Regulation). In order for the LG to be a functional instrument for interagency and interprovince cooperation, work must be done to improve its appreciated and influenceable environments.

- Appreciated environment improvement

It may be hard for the LG itself to take actions to improve its appreciated environment for lack of motivation and avenues, but what is in its appreciated environment well lies within the sphere of influence or control of its superior – the State Council. Many actions the State Council took in the past signify a high degree of concern for Huai River pollution and resolution to control it. Therefore, it is reasonable to expect that the State Council is willing to take measures to create a more favorable appreciated environment for HRB basin wide management institutions (as well as for other major river basins).

The State Council should work toward clarifying administrative responsibilities of the two leading water management agencies (SEPA and MWR). The clarification can take place in one of the two ways: make an unambiguous distinction between the legal definition of water ‘environment’ and ‘resources’ in the related laws, or create a working agreement between the two agencies that specifies their respective authorities and responsibilities in HRB management,

if amendment to or changes of the current water laws are impractical or tedious. While their responsibilities are more clearly divided, the interconnectedness of water environmental pollution and water resource management must be emphasized, thereby motivating the two agencies to cooperate closely on all management issues for mutual benefits because success in one aspect is impossible without improvement in the other.

The State Council can also assemble an expert team, whose main goals are education, communication and evaluation and who reports directly to the State Council. This team of experts should first conduct case studies of successful models of coordinative and unified management of watersheds abroad. The team then disseminates the findings to ministries involved in water quality management as well as riparian governments to educate them about the necessity and *benefits* (more importantly) of such a mode of watershed management. It can also convene a series of workshops and invite concerned officials from each management stakeholder to exchange ideas on the applicability and practicality of ‘unified management’ in HRB.

According to a World Bank study (Saleth, 2000), China has a good precedent for coordinated flood control, which is one aspect of water management. The current administrative arrangement for flood control in China accomplishes a close coordination among all stakeholders under the leadership of the MWR. Although the addition of SEPA into the picture for the purpose of water quality management complicates the issue, some principles and lessons from flood control institutions may still be valid. The expert team can focus on this earlier intuitional success and stimulate similar desires for cooperation and coordination in water quality management.

The expert team should also help raise the awareness among the HRB residents through mass media on issues like the urgency of Huai River pollution control, measures governments have undertaken to combat pollution, values and needs for more coordinated and unified management and ways they can be involved in pollution prevention, monitoring and compliance enforcement.

The expert team should evaluate the current state of coordination among various stakeholders. They can conduct anonymous surveys of HRB management officials to understand the concerns and reservations they have regarding water pollution control in the HRB and coordination with others to accomplish this goal. After the identification of key problems, concerns and obstacles, the expert team can, under the authorization of the State Council, call for stakeholder meetings to establish common purposes and visions among all HRB management stakeholders. The stakeholder meetings can start by examining the world trend in basin water quality management, and then shift the focus to the urgency and severity of problems facing the HRB and ask *all* participants to portray a desirable future for the HRB. The stakeholder meetings should seek to maximize dialogue and communication between competing agencies and reconcile conflict of interests for the benefit of a greater common purpose and vision⁷. The meetings should conclude in a better understanding of “unified management” and a solid work plan for achieving closer coordination in the future.

The State Council can then organize study tours to the model watersheds by key persons who will be members of the LG or in charge of local implementation of water quality management. These study tours have a clear goal to show the power of coordination and

⁷ The idea and methodology of conducting such meetings are taken from class notes of PPS325: Institutional Design for Managing the Environment taught by Francis Lethem.

cooperation and benefits to each stakeholder from such relationships. Therefore, these tours must be carefully designed to maximize their impacts. For example, it can require each member to submit a report summarizing main lessons learned and their experiences from the tour of the model watershed and how those can or cannot be applied to the HRB. These reports may be used as bases for their future job performance evaluation. The State Council can even consider establishing a ‘sister river basin’ relationship between the HRB and one successful river basin abroad to further facilitate exchange of experiences of watershed management. At the same time, it may also seek financial and technical assistance from international organizations.

All above measures aim at building consensus of common water pollution control goals and a vision for unified management among stakeholders and therefore generate demands and legitimacy for a more coordinated and cooperative basin management.

- Influenceable environment improvement

Based on improvements in the appreciated environment, the LG should meet more frequently. It can establish a standing committee that provides more timely response to problems in the watershed. It should create some incentives among local governments to promote information sharing in environmental protection. For example, it may recognize several localities each year that share their successful water pollution control measures with others. Leaders of these localities can receive moral or material awards and be politically accredited. It can also devise similar measures to encourage resource sharing.

It is also important to launch an environmental education campaign in Huai River Basin to improve people’s environmental awareness. A hotline can be established so that citizens can

report anonymously any noncompliance with and violation of water laws by an enterprise or a governmental department.

As for the HRC and Bureau, they should strengthen their links to the LG and expand their environmental professional teams to put environmental concerns back to a high position in their agenda.

Recommendations for future river basin management institutional reform

China's recent accession to WTO will make it more eager to converge to international practices in many fields, which may include river basin management. The upcoming state institutional reform may open a new window of opportunity for more aggressive institutional reforms for river basin management institutions, including that in the HRB. In fact, there already exist a number of proposals on HRB management institutional reform by Chinese scholars. One of them proposed to keep the Bureau and HRC as public affairs institutions (the World Bank Draft Report, 2002), while another called for creation of a new governmental institution that takes over all water related management power (Wang, 2000). Neither of these approaches is suitable because they are both based on a controlled institutional model. The former does not give the institutions much power to work by influence, and the latter will likely to meet much resistance from existing bureaucracies. The tension will likely deter any effort to foster cooperation and coordination.

Based on improvements in the appreciated environment (as previously discussed, which must be worked out first), a more drastic rearrangement of the current HRB management

institutions can be carried out to remedy problems in the influenceable and controlled environments. A new coordinating institution can be established by combining the Leading Group, Huai River Water Resource Protection Bureau and HRC. It should be an independent institution that directly reports to the State Council or National People's Congress (NPC). Because it is independent, the influence from bureaucratic infighting is shielded, and it may maintain its neutrality. Since it is a coordinating institution, it should not be perceived as threatening by relevant line ministries and local governments.

This new institution would have two arms (For an organizational chart, see Figure I.2): a coordinating arm and a supporting arm. The coordinating arm is primarily responsible for coordinating among line ministries and provincial governments in HRB management and it can be a variation of the current Leading Group. The supporting arm provides scientific research, environmental data and policy analysis, which serves as a think tank and a contact point with the public and academia. The supporting arm can be formed by separating the HRC and Bureau from the MWR and combining their staffs. The support arm is mainly a data collector and research conductor, much like the roles of the HRC and Bureau before, but its links with the LG is much more direct and reinforced. The new institution should be funded directly by central budgets to sever its reliance on any particular agency. It should maintain a contact point in the State Council or the National People's Congress (ideally a vice premier or the Chair of the Environment and Resources Protection Committee in the NPC) so that performance of each ministry and local government can be reported to the central government timely. This will also inspire more cooperation and better performance.

Figure I.1
 Current Institutional Arrangement for Huai River Basin Water Quality Management

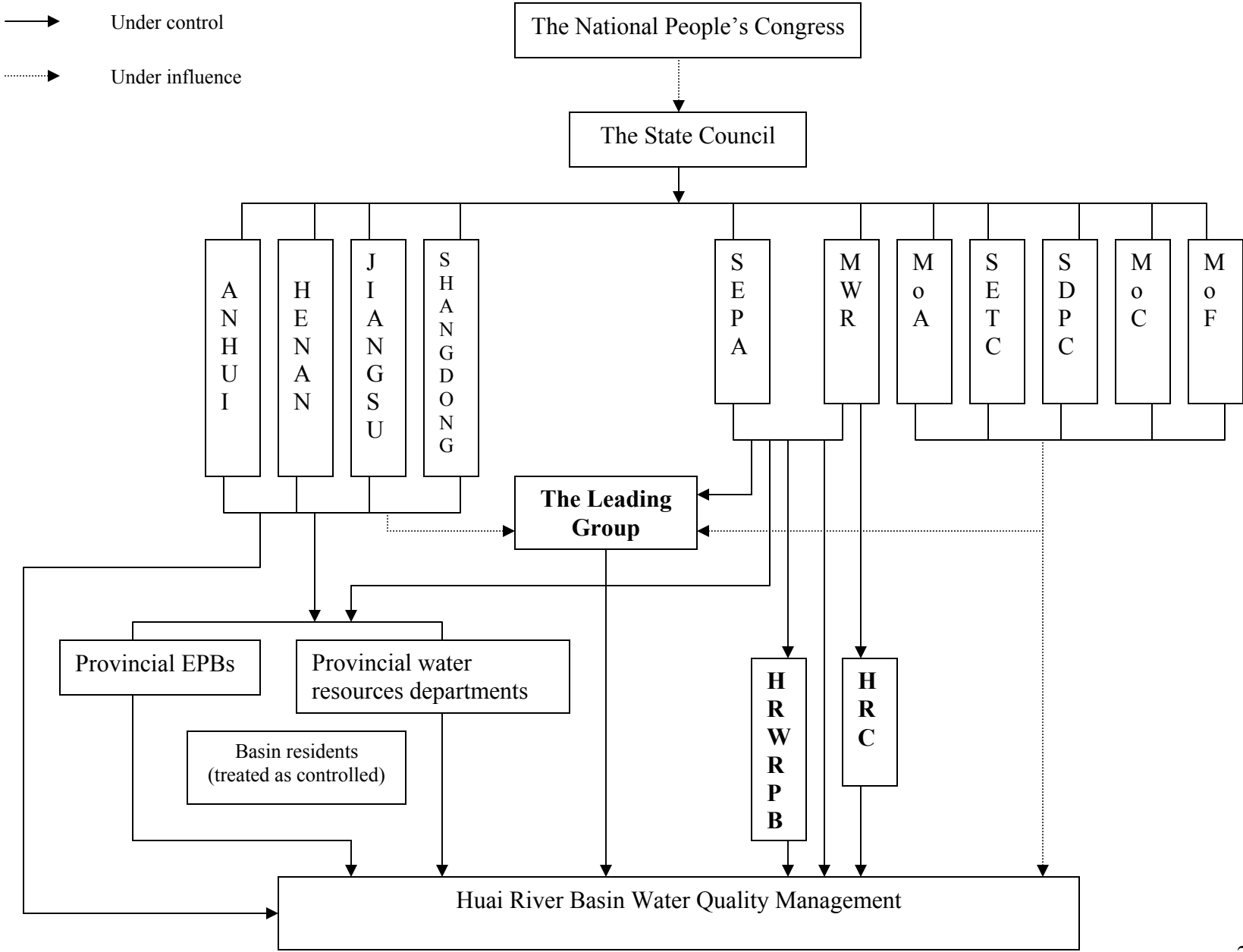
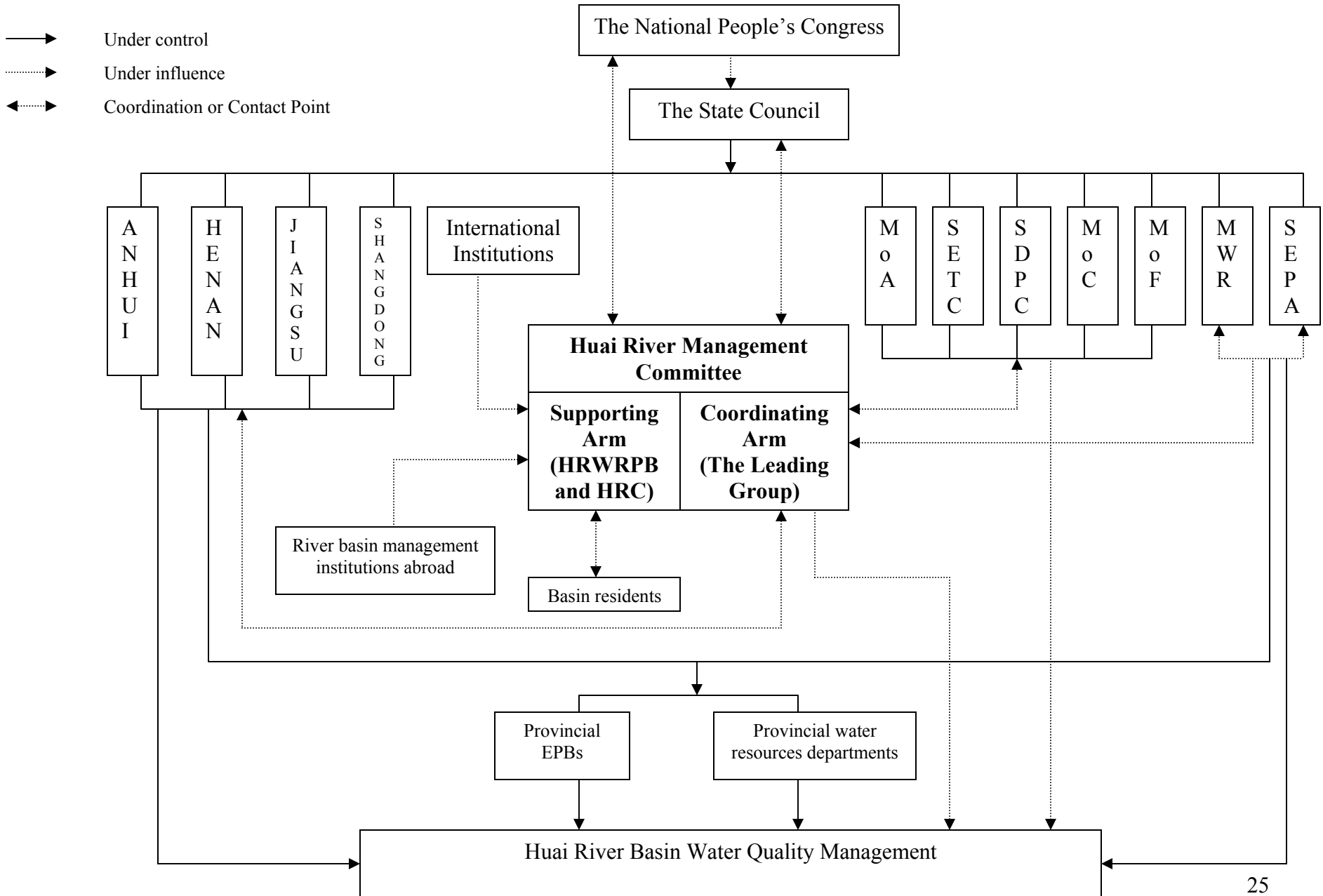


Figure I.2

Proposed Institutional Arrangement for Huai River Basin Water Quality Management (Emphasizing Coordination and Cooperation)



CASE STUDY II: IMPROVING THE WATER POLLUTION LEVY SYSTEM TO BETTER MANAGE HUAI RIVER BASIN WATER QUALITY

Introduction

Environmental policies based on economic incentives in China

China's adoption of market-based incentives (MBIs) in environmental policies has increased with the furtherance of its open door policy and reform toward a more market friendly economy. 'Let markets speak', a phrase that may often be heard in China these days, very well captures the increasing belief in the power of the market. The paradigm shift has inevitably led to wide acceptance and application of market-based instruments in environmental protection and many other regulatory arenas. In 1992, the State Council issued a statement, affirming its determination to utilize the economic incentives to curb the aggravating pollution problem in China. In the statement, the State Council called for the "...full use of economic instruments and market incentives to promote sustainable development and protect the environment, such that market prices completely reflect the environmental costs of economic activities" from all level of governments (Wang, 1997). Currently, a number of MBIs have been implemented in China, which are summarized in Table II.1. Even though under China's special social, economic and political circumstances, these MBIs bear very strong "Chinese characteristics" and are considered only supplementary to a predominantly command and control regulatory regime, they are expected to play a greater role as marketization of China's economy deepens.

Table II.1 Classification of China's Environmental Policy (World Bank, 2001)

Status	Command and Control Instruments	Economic Incentives
Already implemented	<ul style="list-style-type: none"> • Concentration-based pollution discharge limits • Environmental Impact Assessment • Three-synchronous policy⁸ • Centralized pollution control • Two-compliance policy⁹ • Environmental compensation fee • Close-down policy¹⁰ 	<ul style="list-style-type: none"> • Pollution levy system • Non-compliance fines • Subsidies for energy efficient products • Regulation on refuse credit to highly polluting firms
Still in experimental or pilot phase	<ul style="list-style-type: none"> • Mass-based controls on total provincial discharges 	<ul style="list-style-type: none"> • Discharge permit system • Sulfur emission fee • Emission trading

Pollution levy system

The pollution levy system is the longest existing and perhaps the most well known economic instruments used in China's environmental protection. It was experimented in some demonstration areas for three years beginning in 1979, before the State Council passed the "Provisional Rules for Levying a Pollutant Discharge Fee" in 1982 and officially instituted this nationwide program. After some twenty years' development, the Chinese pollution levy system has grown to a magnitude that is without comparison not just in the developing world but in the developed world as well. As of 1996, nearly all counties and cities were included in the program and the number of registered enterprises in the system is still increasing (Wang, 2002). The

⁸ Three synchronous policy, or sometimes translated as three simultaneous policy, requires that the planning, design and construction of pollution control facilities occur at the establishment of an enterprise. A local EPB certification is required for production to begin in this enterprise.

⁹ This term refers to compliance with discharge standards and ambient standards. This policy aims at moving away from concentration-based control to mass-based or total load control.

¹⁰ This policy applies to 15 types of heavily polluting small enterprises, (most of which are TVEs). It requires a non-compliant enterprise to achieve compliance with applicable environmental standards within a mandatory time limit. Failure to achieve compliance by the deadline will result in close down of the enterprise.

water pollution levy is one, and the largest component of this system, which also encompasses the air and solid waste pollution levy. Table II.2 shows the steady expansion of the water pollution levy system in China in terms of enterprises levied and revenue collected.

Table II.2 Expansion of the water pollution levy system (1991-1994) (Zhang and etc, 1997)

	1991	1992	1993	1994
Levied enterprises ($\times 10^4$)	20.59	22.23	25.42	30.04
Total water pollution charges (million Yuan)	1058	1264	1354	1520
General wastewater discharge	62	83	126	201
Charges on effluents above standards	996	1181	1228	1319

Water pollution levy system in the Huai River Basin

The water pollution levy is also widely applied in the Huai River Basin. Table II.3 summarizes its implementation status in the four riparian provinces in 2000 (SEPA, 2001). Because enterprises respond to economic incentives to maximize their profit by reducing costs, according to the authors of the World Bank Draft Project Report, many local environmental officials surveyed during their study consider the pollution levy system as the most important mechanism in addressing industrial pollution in the Basin (Draft report, 2002).

Table II.3 Implementation status of the water pollution levy in the HRB in 2000 (SEPA, 2001)

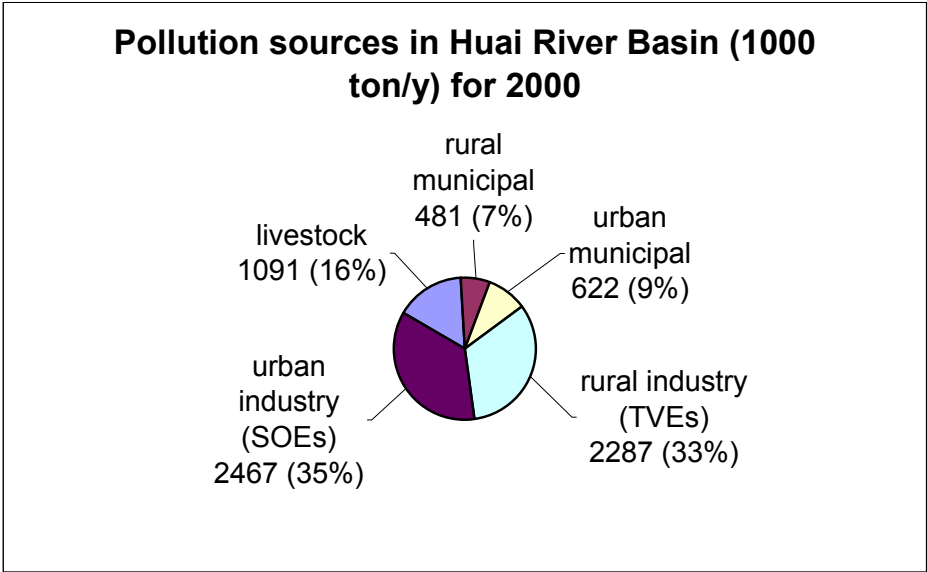
	Anhui	Henan	Jiangsu	Shangdong
Levied enterprises ¹¹	19786	30053	42501	29533
Total water pollution charges (million Yuan)	69.0	81.0	191.3	107.9
General wastewater discharge	10.0	5.2	10.7	14.9
Charges on effluents above standards	59.0	75.8	180.6	93.0

Figure II.1 illustrates the contribution from different sources to the total pollution in the Huai River Basin. Industrial sources are evidently still the principal contributor of pollutants to

¹¹ No water specific data were available from the report. So the number represents the total number of enterprises that were levied a pollution fee for any form of pollution, including air, water or solid waste and therefore is an overestimation of levied enterprise for the water pollution charge.

Huai River, although one notable trend can be observed: the decline of the dominance of pollution from state owned enterprises (SOEs) sources and a sharp rise in the contribution from township and village enterprises (TVEs). This should hardly be surprising because the very rapid regional economic development in the Huai River Basin was driven largely by a proliferation of small and medium size enterprises (which are also Township and village enterprises or TVEs). This trend on one hand shows that the pollution levy has been effective in mitigating industrial pollutions from some industrial sectors, on the other hand, it points to an urgent need to enhance the effectiveness of the system in other industrial sectors. Because of the relative significance of industrial pollution in the HRB and the potential of the levy system to address the problem, the paper will first identify factors that hinder the effectiveness of the current system by using the AIC methodology and examining the three levels of institutional environment. Based on the diagnosis, it will offer recommendations on areas to be reformed to improve the performance of the levy system in all industrial sectors.

Figure II.1 Contribution to total pollution from various sources in HRB (World Bank, 2001)



In the current water pollution levy system, the fee level and structure are determined by the central government, while the implementation is carried out at the local level by local environmental authorities. They are responsible for calculating and collecting the appropriate fee to be charged from a particular enterprise based on its pollution discharge in exceedance of the standards. Hence, unlike the previous analysis, which focuses on a basin-wide institution, the unit of analysis in this part is local (usually county or city) level environmental authorities.

DIAGNOSIS OF THE PROBLEMS USING THE AIC

METHODOLOGY

Appreciated environment

- Macroeconomic enabling environment

The analysis starts from the most fundamental macroeconomic enabling environment for the smooth operation of the pollution levy system (or any other types of MBIs). The World Bank's Pollution Prevention and Abatement Handbook (1998) identifies competitive market and well-developed market for environmental services as two key ingredients of a supportive macroeconomic condition for implementation of pollution charges. Competitiveness is the basis for a well-functioning market, while MBIs' success hinges largely upon a well-functioning market that can signal to enterprises, through prices, the appropriate output levels for profit maximization. Although China has achieved steady progress and admirable success in the liberalization of its domestic market, the process is far from completion. China's economy still

relies heavily on central planning and state owned enterprises still enjoy subsidies, protection and support in various degrees, which may shield them from the price signal sent by the market and subject them to “soft budget constraints”. Hence, they are less likely to respond to economic incentives and change their polluting behavior accordingly. China’s market for environmental services is also still very under-developed.

- Legal foundation and administration of the water pollution levy system

The 1984 Law of the People’s Republic of China on Water Pollution Prevention and Control (WPCL) and its 1996 amendment provides the legal basis for the water pollution levy system in Article 15¹². But it is the 1989 Procedures to Implement the Law on Water Pollution Prevention and Control that spells out the detailed guidelines and rules for the implementation of this system. The Procedures set water quality and discharge standards, specify fee levels for the levy and assign administrative responsibilities (Zhang, 1997).

China’s water pollution levy system consists of two components: a wastewater discharge fee that has to be paid by any enterprise (or institution) that discharge wastewater into water bodies and a mandatory levy on enterprises (or institutions) whose discharge of wastewater exceeds the applicable standards. The general wastewater discharge fee is charged for *all* effluent from an enterprise based on volume and is currently set at 0.05 Chinese Yuan per ton of wastewater. The standard-exceeding pollution levy, on the other hand, only applies to the

¹² Article 15 requires that: “1). All enterprises and institutions that discharge pollutants into a water body shall pay a pollutant discharge fee in accordance with State regulations; if the discharge exceeds the standards, they shall pay an additional fee for discharge in exceedance according to State regulations. 2). The fees paid for pollutant discharge and for excess discharge must be used for prevention and control of water pollution and may not be used for any other purposes. 3). Enterprises and institutions whose discharge of pollutants exceeds the applicable standards must prepare plans to bring the discharge into conformity with the standards, and shall submit, for the record, such plans to the environmental protection department of the local people's government at or above the county level in the place where they are located.”

amount of discharge above the standard. The charge is calculated based on a provided formula taking into consideration factors such as type of pollutants and extent to which the standards are exceeded¹³. In reality, the latter component forms the bulk of the total charges (see Table II.2). After the fee is collected, it can only be spent in two ways: up to 80% of the revenue must be returned to the levied enterprises as low interest loans to invest on pollution abatement facilities (the loans can only be used to environmental purposes), the remaining 20% can be used to strengthen local EPBs' capacity and cover administration costs of the system.

- Stakeholder analysis

Two groups of main stakeholders can be easily identified: regulators, which consists of at least the State Council, the MoF, SEPA, local EPBs and other local governmental agencies; and enterprises. Although the importance of another two major stakeholders, namely general HRB residents and media should be acknowledged, due to reasons discussed in the previous analysis and their lower direct involvement in the levy process, they are omitted from the following analysis.

Consensus among stakeholders on common goals and objectives is crucial to the long-term success of any institutions (Smith and Lethem, 1983). It is also identified by the World Bank (1998) as an important issue for the success of a pollution charge system. In China's

¹³ Take COD for example: If the discharge does not exceed the standard by 20,000 ton, then the fee on each unit of discharge in exceedance of the standard is 0.18 yuan. If the standard is exceeded by more than 20,000 tons, each unit of exceedance is charged at 0.05 yuan, and the enterprise also has to pay a lump sum levy of 2,600 yuan. For example, if an enterprise discharges 19,999 tons of wastewater above the standard, it has to pay $19,999 \times 0.18 = 3599.82$ yuan for the levy. If it discharges 20,001 tons in exceedance, then the total levy is $2,600 + 20,001 \times 0.05 = 3600.05$ yuan. This threshold is different for different pollutants and per unit charge varies by pollutants too. The most expensive pollutant is Hg at 2 yuan per unit of exceedance (Wang, 1997). To know more about fee level for different pollutants, see Zhang, 1997; for more on formula to calculate the levy, see Wang 2000.

pollution levy system, the goals and objectives of the identified stakeholder are divergent, which can be seen from the following aspects:

Between environmental decision makers and economic decision makers

Environmental and economic decision makers have different priorities (and thus competing interests). This phenomenon was termed the “dissonant mental model” by Hukkinen in her survey of Chinese environmental managers: environmental decision makers would like to enforce environmental regulations for the sake of long-term environmental sustainability, while economic decision makers are concerned more with economic development and employment, fearing that too stringent environmental regulations will hurt the growth and trigger unemployment (Hukkinen, 1999). When competition arises, the latter often prevails. The current rate and structure of the levy were last revised jointly by the SEPA, MoF, SETC and SDPC in 1991. The latter three agencies are responsible for making all macroeconomic policies in China. With economic development as the dominant priority, the rate of the levy does not reflect the environmentally optimal level, but is rather based on consideration of economic reality of and impact on industrial enterprises.

Between the central government and local EPBs

The pollution levy system may serve two purposes: to reduce pollution and induce sounder environmental management within an enterprise, and to raise revenue for local governments. The former is indisputably the primary intention of the State Council when it initiated this national program. However, during the implementation, due to their tight budget and resource, local EPBs tend to emphasize the latter over the former. This leads to higher incidences of “illegal use” by diverting the collected fees to purposes other than investment on

pollution abatement technologies and environmental institution capacity building as stipulated by law. According to Wang, between 1981 and 1996, 13.76% of the total collected levy was used “illegally” (Wang, 1999).

Between environmental regulators and enterprises

While environmental regulators eye long-term environmental sustainability, enterprises often prioritize short-term economic gains (maybe many of them do not see themselves last that long, especially TVEs). For many enterprises, installation of pollution abatement facilities is an extraneous obligation that will further increase their costs and squeeze away their already meager profits. This discrepancy in thinking is also demonstrated in the reluctance of enterprises to adopt voluntary measures to reduce environmental pollution, such as corporate environmental management systems, which are very underdeveloped even in major SOEs.

Between SOEs and TVEs

Two vastly different types of enterprises coexist in China: State-owned enterprises (SOEs) and township and village enterprises (TVEs). Even though SOEs are still the mainstream in China’s economy, TVEs has become an increasingly stronger impetus to the rapid development in many areas. The success stories of Jiangsu and Shangdong provinces in the HRB owe largely to the emergence and proliferation of TVEs. In fact, TVEs are already the principal industrial sector in Jiangsu, accounting for one third of Jiangsu’s GDP and two thirds of its industrial production (Zhang, 2003). Along with the growing number of TVEs is increased pollution from them. In 1995, total volume of wastewater from TVEs accounts for 21% of all industrial wastewater discharge in China, while total COD emissions from TVEs account for 44.3% of all industrial COD discharge (SEPA and etc., 1997). These figures indicate that TVEs

are much more pollution-intensive than SOEs. The problem of TVE pollution is particularly severe in the HRB. The same SEPA report also showed that Henan, Jiangsu and Shangdong combined are responsible for 29% of all TVE wastewater discharges in China and Henan and Shangdong alone also account for 32.9% of total TVE COD discharge (SEPA and etc., 1997). It is striking to see that a medium-size river basin like HRB concentrates almost a third of the nationwide pollution from TVEs.

Traditionally, TVEs have been successful in evading stringent environmental regulations, including the pollution levy. As a sector that contributes to almost 50% of the gross domestic industrial production, pollution charges levied from TVEs only accounts for 13.4% of the total. There are many explanations for this pattern: first, most TVEs, as their name suggests, are located in rural areas where administrative capacity of environmental authorities are weak, if existing at all. Second, they are often the pillars of local economy and are protected by local governments. Third, TVEs are geographically diffused, industrially diverse and operationally short-lived. All these features make it administratively more difficult to enforce the rules on TVEs.

- Systemic issues with the water pollution levy system

In addition, the design of the water pollution levy system also suffers from a few marked weaknesses:

- The rates are too low: The rates of the levy remained the same for many years since they were last revised in 1991 despite rapid development and inflation during the

period¹⁴. Thus, they are declining in real terms. The total charge does not reflect fully the environmental cost of pollution treatment and environmental damage. It in fact introduces a disincentive for enterprises to install pollution abatement equipments because the levy they pay is much less than the operational cost of such equipments (Wang, 1997). Studies have shown that the levy amounts to only 20-50% of the pollution abatement cost of an enterprise, and can be as low as 10% for some industries (World Bank, 2001).

- Charge is based on a single pollutant: The levy is calculated independently for each pollutant an enterprise discharges that exceeds the relevant standard. In the case of multiple violations, an enterprise only needs to pay for the pollutant with the highest levy. Therefore, it is possible, as it often happens, that an enterprise with more total pollution discharges would end up paying less pollution levy than an enterprise that releases a smaller amount of pollution that contains “expensive” pollutants. This creates inequity and hurts the enterprises’ willingness to reduce *all* pollutants in their effluents (Qian, 1998).
- “Hair of goat comes from goat”: This is a Chinese idiom referring to the fact that the benefit one receives is coming out of his own pocket. After paying the pollution levy, up to 80% of that money will be returned to the levied enterprises as low interest loans to invest in pollution abatement technologies. This is not very consistent with

¹⁴ There are a number of exceptions: The rate can be raised for severely polluting enterprises upon the SEPA’s approval. For pollutants not included in the standards, each province can determine its own local discharge and levy standards. If an enterprise fails to comply with the discharge standards for a consecutive 3 years, from the third year on, its charge rate shall increase by 5% every year when it is in non-compliance until it attains the discharge standards (Hu, 1996).

- the “Polluter Pays Principle” the system intended to reflect (Hukkinen, 1999). As the consequence, some enterprises even consider the levy “their money”.
- End-of-pipe control technologies: Provincial environmental protection bureaus do not recognize production process improvement, which may reduce pollution in a cheaper and more effective manner, as “environmental investment” in their narrow definition of the term¹⁵. Therefore, they refuse to grant low-interest loans to investments on such initiatives in the levied enterprises. This is in effect channeling environmental investments toward end-of-pipe control technology only (Hukkinen, 1999).
 - Calculation of charges is based on concentration of the effluents: Some enterprises will simply dilute the effluents to forge compliance with the standards. There is a need for the standards to shift from concentration based to mass based (Qian, 1998).

Influenceable environment

Since industrial enterprises do not directly fall under local EPBs’ jurisdiction, EPBs have to implement and enforce the pollution levy by influence. The influence power is of particular importance in two stages: 1) acquisition of accurate information about an enterprise’s pollution discharges as the basis for calculation of the appropriate total levy, and 2) collection of the full amount of levy the enterprise should pay.

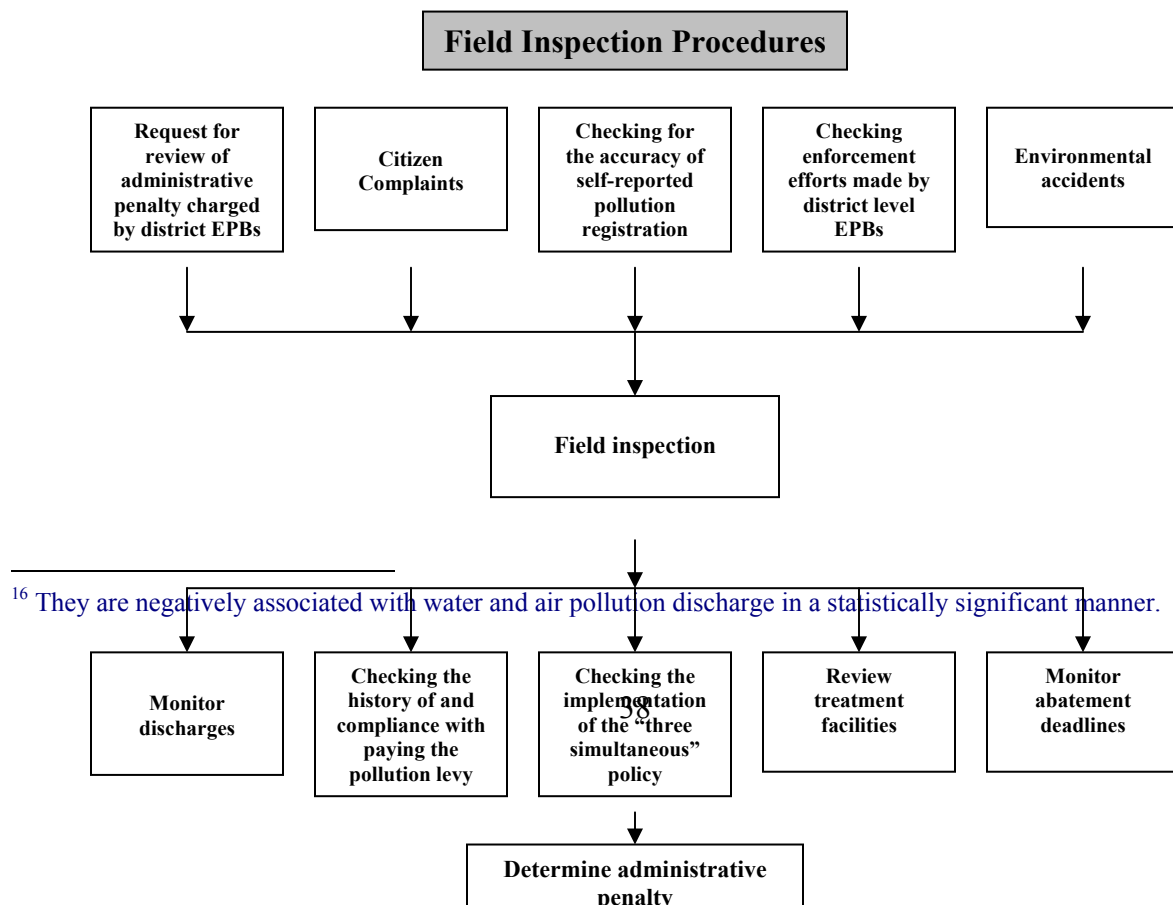
China’s current pollution levy system adopts a self-reporting mechanism as the primary means for local EPBs to obtain information regarding pollution discharges from industrial enterprises. All polluting enterprises are required to register with the EPBs. They should, on a timely basis, submit information on their pollution discharges to local EPBs. For the water

¹⁵ According to Hukkinen, they consider it a “normal business investment”.

pollution levy, an enterprise must report its total volume of water use and wastewater discharge, pollutant concentrations in its effluents and total discharge time. Its report is then subject to verification by EPBs in the forms of checking for internal consistency of data, comparing to historical data from the same facility, monitoring the discharges from the enterprise and surprise inspections. If falsification is discovered, additional penalties will be imposed (Wang and Wheeler, 2000). Figure II.2 illustrate the processes by which inspections are done.

One study has shown that (Dasgupta, 2001) inspections contribute to reductions in water and air pollution¹⁶. In fact, inspections seem to be the main avenue for EPBs to exert their influence on enterprises to ensure honest reporting. This is probably due to the deterrence of strict administrative measures and legal liability associated with false reporting and other violations of environmental regulations discovered by inspections, but limited financial and human resources may prevent local EPBs from conducting inspections more frequently (Hu, 1996).

Figure II.2 Field inspection procedures (Dasgupta, 2001)



¹⁶ They are negatively associated with water and air pollution discharge in a statistically significant manner.

However, influence power through inspection does not help with fee collection. EPBs' influence power in this area is frequently eroded by enterprises' bargaining power. In many circumstances, EPBs must negotiate with enterprises to agreed upon a fee level the enterprises will pay¹⁷. Enterprises with greater bargaining power can often get away by paying less than they should. Several factors affect the balance of the two powers and determine the completeness of levy collection¹⁸. Due to heterogeneity across regions in China and industries, EPBs' ability to collect the levy, measured by *effective* rates of pollution levy¹⁹, also shows remarkable disparities among different regions and across industrial sectors. Wang and coworkers found in their study (1996) that more affluent and heavily industrialized coastal provinces impose much higher effective rates of levy than their interior counterparts. The pattern in the HRB supported their conclusion. As can be seen in Table II.4, the two wealthier

¹⁷ EPBs must negotiate because some enterprises may not be able to pay the levy in its entirety.

¹⁸ Completeness is measured by the percent of total levy that should be collected that was actually collected.

¹⁹ Effective rates refer to actual rates for per unit of above-standard wastewater discharge collected in each province. The rates in the table are all in 1990 Yuan.

coastal provinces in the basin (Jiangsu and Shangdong) charge an effective rate of levy almost twice as high as that charged by their poorer neighbors.

Table II.4 Effective rates of pollution levy for COD discharge in Yuan in the four HRB provinces (1987-1993) (Wang, 1996)

	1987	1988	1989	1992	1993
Anhui	0.05	0.05	0.05	0.07	0.09
Henan	0.06	0.07	0.08	0.08	0.07
Jiangsu	0.11	0.11	0.09	0.15	0.13
Shangdong	0.15	0.14	0.15	0.15	0.16

According to Wang and Wheeler (2000), factors affecting the influence power of local EPBs are the degree of economic development, quality of the environment and level of residents' education in a particular region. Greater economic development, worse environmental quality and higher level of education achievement all tend to lead to greater ability for local EPBs to implement and enforcement the pollution levy system and improve environmental performances of local enterprises.

On the other side, the bargaining power of an enterprise is associated with its ownership type, financial situation, its economic significance in the region and the social impact of its pollution. Wang and Wheeler (2002) found that SOEs, firms in difficult financial standings, companies with heavy pollution and locally significant enterprises tend to have greater bargaining power than TVEs, firms in good financial standings, companies with marginal pollution and enterprises not so important in local economy.

Controlled environment

Even though more than 20% of the total levy went to environmental capacity building of local environmental institutions and to cover administrative cost of the system, local EPBs are still severely understaffed, under-resourced and less motivated to carry out their job successfully. This situation poses a great challenge to the administration of the pollution levy system (and many other environmental regulations).

Perhaps the biggest puzzle facing EPBs is the so-called “horizontal-vertical” issue, which greatly constrains their effectiveness in implementing and enforcing the pollution levy system. Local EPBs often feel torn between their dual allegiances. While they are obligated to report to the upper level EPBs and ultimately to SEPA (vertical), they receive their budgets from the local governments in whose jurisdictions they are located (horizontal). They often have a difficult time reconciling the requirement by SEPA to strictly enforce an environmental regulation and the wish of local governments for loose enforcement of environmental regulations, which seem to them are barriers to the expansion of production in industrial enterprises. For practical reasons, local EPBs’ position is more inclined toward that of the local governments’, particularly when a local government happens to be the owner or partial owner of a polluting enterprise. In addition, the current administrative setup makes local EPBs very susceptible to interference from local governments (World Bank, 2001).

The State Council has set very ambitious environmental agendas in the face of serious pollution problems in China. As the result, local EPBs assume more responsibilities mandated by all kinds of environmental laws. Notwithstanding the multiplication of their mandates, their

resource base, both financial and human, has shrunk in the 1990's. The shortage in resources is especially felt in areas such as supervision and monitoring activities, both of which are important to the maintenance of the water pollution levy system. Many EPBs are severely understaffed and under-financed and are simply overwhelmed by their responsibilities. Although some EPBs become desperate in collecting pollution levy, because it supports up 90% of its operation costs, it creates further problems with the illegal use of the levy and reduces the credibility of the system (World Bank, 2001).

Summary of diagnosis

From the analysis, it is evident that the current levy system suffers from many defects, which explains its ineffectiveness. The problems exist in all three levels of the institutional environment and require remedies addressing the different needs at different levels.

In the appreciated environment, the most outstanding problems seem to be the lack of consensus among stakeholders, deficiency in the macroeconomic enabling environment and flaw in the architecture of the pollution levy system itself. The first problem probably reflects the constant and ongoing struggle of environmental protection to gain more prominence in the political agenda and people's awareness that have been so heavily dominated by economic development concerns. The second and third problems, however, both arise from the fact that China is still in the transition from a centrally planned economy to a market economy. Inevitably, many of its policies still bear the strong characteristics of the old system, and therefore no longer suit the newly emerging circumstances in China. This may just be part of the growing pains of the nation.

In the influenceable environment, EPBs do possess some influence power backed up by strict command and control measures, especially in the area of information acquisition.

However, their ability to actually collect the levy from enterprises varies remarkably, reflecting the differences in the degree of economic development, quality of the environment and level of education in the jurisdictions in which they are located. In addition, their influence power is countered by enterprises' bargaining power, especially from those enterprises that are owned by the state, in bad financial standings and locally important. The exercise of bargaining power by enterprises makes the job of EPBs much harder.

Finally, in the controlled environment, current administrative setup, budget allocation for EPBs and the increasing gap between the responsibilities they have to carry out and resources available for them to do so have overwhelmed local EPBs and make it very difficult to them to do their job effectively.

RECOMMENDATIONS

Appreciated Environment

China should foster a supportive macroeconomic enabling environment for the implementation of MBIs, including the water pollution levy. As an essential component of such an enabling environment, China should further its marketization process and continue to remove the soft budget constraint that many SOEs now enjoy and replace that with a hard budget constraint so that SOEs are more sensitive to cost considerations and market signals. At the same time, China should make strategies to encourage and provide support for the development and maturation of the environmental services market. Such a market would allow enterprises more options to achieve cheap pollution reduction.

Environmental awareness among key stakeholders (government agencies and enterprises alike) must be improved, because it is the basis for achieving a common environmental vision among them. This can be accomplished via public propaganda and education. An important measure to ensure the consideration of environmental consequences in economic development is for the central government to gradually integrate environmental sustainability into long-term national development goals and plans (World Bank 2001). Stakeholder participation in environmental policy making and enforcement should be enhanced so that all stakeholders would have an opportunity to express and agree upon a desirable state of the environment for them. Thus, they would actively identify with the environmental goals and be willing to abide by them rather than passively comply with a top-down command that seems irrelevant.

The environmental legal framework and the role of courts in the enforcement of environmental regulations should be strengthened. There needs to be a balanced use of

economic, voluntary and command and control instruments in environmental management so that one instrument is backed up and reinforced by another to achieve the best results. Some command and control measures are found to have a very strong deterring effect on TVEs. For example, the close-down policy²⁰ seems to be particularly effective in dealing with TVEs in pollution-intensive industries. This instrument can be used in conjunction with the water pollution levy system to provide incentives for TVEs to pay the levy and reduce pollution to avoid mandatory shutdown. In fact, polluters in China are subject to not only financial penalties, but legal liabilities as well: paying the levy does not exempt an enterprise from criminal charges. This requires a greater role of courts in the enforcement of environmental regulations.

Currently, relevant agencies are launching a comprehensive reform of the levy system. This opens a window of opportunity and many of the hard issues can ride the wave to be solved. Based on the diagnosis, the following reforms are desirable:

- The rates of levy must be increased substantially so that total levy charged from a polluting enterprise would be slightly higher than its total pollution abatement costs (almost all references). Rates of levy should not be fixed. Instead they should be adjusted according to the price index (World Bank, 2001).
- Total pollution charge should stop being based on a single pollutant that incurs the highest levy, but be on multiple pollutants instead. The total levy should be the sum of the charge for each pollutant that an enterprise emits (almost in all works).

²⁰ See table II.1 for explanation.

- The discharge standards should shift from concentration based to total load or mass based. This shift is also consistent with the discharge permit system and pollution control objectives in the HRB, both of which are based on total loads, not concentration.
- Clean production and whole-process pollution management should be preferred and encouraged by SEPA and its local counterparts over the end-of-pipe pollution control methods. Investment on such initiatives should be supported by the loans through the levy revenue. The revenue can also be used to promote the adoption of corporate environmental management systems and ISO 14001 certification within industrial enterprises.

Influenceable environment

In the diagnosis, it was found that EPBs' influence power is positively associated with higher degree of economic development, more serious environmental pollution and higher level of education of Basin residents. Local EPBs cannot do much to change the first two factors, so the most effective way for them to enhance their influence power is to build up public awareness of the environmental problems and increase media exposure of "bad" enterprises. To that end, they can launch environmental awareness campaigns, disseminate environmental information and augment local schools' environmental curriculum to increase the voice of "environmental protection". Of course, many of the activities they undertake must be done in cooperation with other local governmental departments, such as the department of education and department of communication. Citizen report and complaint would also potentially have a strong positive role.

Local residents can be mobilized to monitor the environmental performance of enterprises and report their violations. For example, EPBs can open up a hotline to receive public complaints on enterprises' non-compliance activities. This may be more cost-effective than doing all the monitoring by themselves and more effective because of the community pressure placed on the polluting enterprises.

Since inspection is one of the major ways for EPBs to exert their influence, it should be strengthened. One of the barriers to more frequent inspection is cost. It may be overcome through a win-win solution, whose central idea can be captured by the term "trust for less inspection". Basically, local EPBs can reach agreements with enterprises that they would be exempt from inspection if two conditions are met. First, they should conform to the discharge standards for a consecutive three years; and second they should prepare, submit and start to implement an internal environmental management plan. This program provides enterprises an incentive to join because they can avoid a cumbersome administrative obligation and the interference with production due to inspections. For EPBs, it is cost saving. Some supplementary measures can be taken to prevent the breach of trust. A list of the enterprises which enjoy reduced frequency of inspections can be publicized. This serves two purposes. On one hand, by publicizing the list, the enterprises on the list would be perceived as "environmentally friendly" and their images will be enhanced. This would give them benefits and additional incentives to join the program. On the other hand, the publication also subjects them to public supervision. Breaches of trust should also incur substantial penalties.

Controlled environment:

The resources available to local EPBs must match their ever-expanding responsibilities and be increased substantially. Of course, tasks of local EPBs must first be properly prioritized, so that resource needs can be reasonably estimated. Financially, more funding should be allocated to local EPBs to support their operation and implementation of national programs and to retain skillful staffs. Technically, training should be conducted at the county level to provide staffs there with incentives and skills to better implement the pollution levy system. In localities where technical and financial conditions allow, installation of computerized monitoring and information management systems should be encouraged to facilitate enforcement. Human resource wise, more recruitment needs to be done to replenish a shrinking staff base at local EPBs. Administratively, the bureaucratic status of local EPBs should be further elevated.

The vertical-horizontal puzzle must be resolved. The vertical ties to upper level EPBs should be strengthened while the horizontal dependence on local governments should be severed, so that local EPBs have more commitments and less interference in the enforcement of environmental regulations. Ideally, their budgets should come from central budget, but that will require reform of the entire fiscal system (World Bank, 2001). There are other options to solve this problem which are more realistic: increasing the direct regulatory function of SEPA itself; gradually reducing the regulatory responsibility of local EPBs and delegating more power to municipality- and province-levels EPBs; and improving supervision and audits of the performance of lower level EPBs by higher authorities (World Bank, 2001).

CONCLUSION

This paper introduces a new way of looking at Chinese institutional management, which relies on the recognition of “external factors” and “influence” rather than “internal matters” and “control”. The latter view is especially prevalent and deep-rooted in the mindset of institutions in China, as the consequence of over two thousand years of reign by feudal authoritarian political regimes. The “Forbidden City” in Beijing, despite its grandeur, serves as a living reminder of how decisions regarding the fate of a nation had been formulated in a close and inward-looking manner until as recently as 90 years ago, when the last feudal dynasty was overthrown. Hukkinen provides a more recent observation that illustrates the persistence of the “control” mindset in China and among Chinese institutions during her interview with Chinese environmental managers.

She first obtained the Chinese translation of the English word “manage” (“Guan Li”). That Chinese translation, when translated back into English using a Chinese English dictionary, revealed connotations such as “control”, “supervise”, “command”, “administer”, “run” and “handle”, none of which carried the meaning of “arrange” and “get along” (among others) that the word often denotes for westerners (Hukkinen, 1999). This interesting discovery, although hardly conclusive, is at least an indication of the tremendous difficulty in trying to challenge and change that mindset.

Yet, those are exactly the things this paper attempts to achieve. In the narrower sense, the two case studies look beyond the respective institutional boundary for solutions of difficult

problems an institution is facing. They identify necessary reforms to be carried out to enhance the environmental performance and improve the water quality in the Huai River Basin. But in a broader sense, they are intended to exemplify the power and superiority of such a new philosophy of institutional management. The paper challenges the readers to step out of their accustomed “command and control” thinking. It demonstrates that the catalyst for improved performance does not rest upon the insatiable acquisition of power, but rather the greater synergy among the stakeholders created by the intelligent use of “influence”. Thus, despite the relatively limited scope of the paper, the lessons abstracted may find much greater implications.

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