

ASIAN DEVELOPMENT BANK

TAR: PRC 38555

TECHNICAL ASSISTANCE

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR THE

**EVALUATION OF ENVIRONMENTAL POLICY AND INVESTMENT FOR
WATER POLLUTION CONTROL IN THE HUAI RIVER BASIN AND THE TAIHU
LAKE BASIN**

November 2004

CURRENCY EQUIVALENTS

(as of 8 November 2004)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.1208
\$1.00	=	CNY8.2765

ABBREVIATIONS

ADB	–	Asian Development Bank
EPB	–	environmental protection bureau
FYP	–	Five-Year Plan
HRB	–	Huai River Basin
MOA	–	Ministry of Agriculture
MWR	–	Ministry of Water Resources
PMO	–	project management office
PRC	–	People's Republic of China
SEPA	–	State Environment Protection Administration
TA	–	technical assistance
TLB	–	Taihu Lake Basin
TRM	–	Tripartite Review Meeting

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	General intervention
Sector	–	Agriculture and natural resources
Subsector	–	Environment and biodiversity, water resources management
Theme	–	Environmental sustainability
Subthemes	–	Natural resources conservation, environmental policy and legislation

NOTE

In this report, "\$" refers to US dollars.

This report was prepared by a team consisting of B. Carrad (team leader), X. Ma, Y. Zhou, Z. Niu, and Q. Du.

I. INTRODUCTION

1. The Government of the People's Republic of China (PRC) requested technical assistance (TA)¹ from the Asian Development Bank (ADB) to evaluate the effectiveness of environmental policies, plans, and investment programs for water pollution control, with a focus on the Huai River basin and the Taihu Lake basin. The Government and ADB agreed that this TA will replace the earlier proposed TA for optimizing environmental programs sponsored by international aid agencies and will be included in the 2004 pipeline.² After receiving ADB Management's endorsement of the concept for this TA, a Fact-Finding Mission in August-September 2004 held discussions with the State Environment Protection Administration (SEPA) and reached an understanding with the Government on the detailed objectives, scope, terms of reference of consultants, cost estimates, and implementation arrangements for the TA.

II. ISSUES

2. Improved environmental management is essential in the PRC as the current level of environmental damage imposes an extremely high cost of at least 4–5% of annual gross domestic product.³ Water pollution control is a major concern.⁴ Water quality and quantity in three important rivers (Hai, Huai, and Liao) and three major lakes (Chao, Dianchi, and Taihu) have dramatically declined since the 1970s. The Government placed top priority on environmental improvement in these three rivers and three lakes during the 9th (1996–2000) and 10th Five-Year Plan (FYP, 2001–2005) periods. Policies and plans were developed, and investments were made; however, 10 years later these water bodies have not become cleaner. On the contrary, due to rapid economic growth, continuing urban expansion, and slow cleanup progress, the gap between the environmental goals and the capacity to achieve them appears to have widened.

3. The Huai River basin (HRB) covers 270,000 square kilometers (km²), has a population of 165 million, and is one of the largest and most polluted river basins in the PRC. The main stem originates in Henan Province with a total length of 1,000 km, and flows through Anhui, Henan, Jiangsu, and Shandong provinces, including 35 cities and 189 counties. In 1995, the State Council set a target – “Huai River becomes a clean river by year 2000” and approved the 9FYP for water pollution control, requiring that, by the end of 1997, centralized domestic wastewater treatment plants would have been built in 256 cities, all industrial enterprises along the river would be meeting effluent standards, and 5,000 small-scale polluting enterprises would have been shut down. However, more than 200 serious water pollution accidents have been recorded, with “super pollution” events in 1989, 1992, 1994, 2001, 2002, and 2004 that typically covered pollution belts of 100–150 km and caused drinking water supply difficulties for many hundreds of thousands of people, loss of aquatic life, as well as economic losses. A World Bank study of the Huai River in 2000 showed major pollution sources as urban and rural

¹ The TA first appeared in *ADB Business Opportunities* (Internet edition) on 13 August 2004.

² The originally proposed TA had limited scope and policy impacts. ADB, therefore, recommended that it be replaced with a new TA proposal that reflects the Government's priorities and has strong policy implications.

³ World Bank. 1997. *Clean Water, Blue Skies*. Washington, DC. estimated that air and water pollution cost China about 8% of gross domestic product. “Green GDP” estimates will be officially made by the State Environmental Protection Administration (SEPA), starting in 2004 on a pilot basis in selected areas.

⁴ Water pollution is caused by various contaminants including agricultural fertilizers, herbicides, insecticides, urban toxic chemicals, oil, sediments, salts, bacteria, and nutrients from livestock and faulty septic systems as well as atmospheric deposits. “Point” pollution is direct discharges through discrete conveyance systems to water bodies, typically municipal wastewater and industrial wastewater. “Nonpoint” pollution is diffuse discharges that occur over large areas; sources include agriculture runoff, agrochemicals, urban runoff, mining dumps, forestry management, and airborne particulates. “Point” pollution is often simpler to control than “nonpoint” pollution.

industry (67%), livestock (16%), and rural and municipal sources (16%). Major industrial pollution sources were papermaking (57%), brewing and distillation (19%), and food (8%).⁵ Moreover, 2002 monitoring data on 93 river sections showed 44% of the sections did not meet the Class V ambient water quality standards, and 39.8% of sections fell into Class V.⁶

4. The Taihu Lake basin (TLB) covers 30 counties and cities across Anhui, Jiangsu, Shanghai, and Zhejiang provinces. The population is about 36.1 million with 18.4 million rural people. The lake supports irrigation and water supply for surrounding cities. The Huangpujiang River, Shanghai's most important water source, also relies mainly on flows from the lake. Major problems are (i) underdeveloped flood management, (ii) water pollution, and (iii) water shortages due to poor raw water quality. Although sewerage treatment has doubled from 600,000 tons treated to 1.3 million tons treated, thus approaching the 10FYP target, industrial pollution loads into the Taihu Lake have increased, not decreased.

5. The Government has implemented major time-bound environmental plans and investment programs to curb water pollution in both basins, including urban wastewater treatment, industry readjustment, industry emission control, watershed management, sewerage collection, water supply, urban waste treatment, ecosystem rehabilitation, dredging, nonpoint source pollution control, and capacity building. In the 10FYP, 488 projects with total investment of CNY25.59 billion (\$3 billion) were planned in HRB and 255 projects with total cost of CNY20 billion (\$2.4 billion) have been planned in TLB. By the end of 2003, 89 projects had been completed in HRB, and 53 in TLB. A series of laws and regulations have been adopted to confront water pollution since the 1980s. The Water Pollution Prevention and Control Law was first promulgated in 1984. In 1994, the State Council issued the Regulation on HRB Water Pollution Prevention and Control, the first location-specific law in the country. However, the legal and regulatory system has not worked adequately, and the victims of water pollution have not been given adequate attention.⁷

6. In the two basins, the provinces concerned have primary responsibility for controlling water pollution to ensure water quality within provincial boundaries. However, SEPA as a national body and the environmental protection bureaus (EPBs) at provincial and lower levels for water pollution control, are chartered to control only urban industrial waste pollution and do not have jurisdiction over other sources of water pollution in municipalities (e.g., sewage) or agricultural wastes (non-point pollution). Since the beginning of the 9FYP, the PRC's institutional framework has been strengthened. A dialogue mechanism has been established whereby the Premier and other Cabinet members meet annually with SEPA officials to discuss the strategy for environmental protection and sustainability.⁸ However, collaboration across sectors is weak, mandates overlap, and division of responsibilities is unclear. SEPA/Ministry of Water Resources (MWR) formed a high-level committee but the work is delegated to local governments. Local governments have insufficient incentive, as to effectively regulate polluters is to directly reduce their income. The EPBs are similarly affected and there was no clear plan at

⁵ World Bank. 2001. *Agenda for Water Sector Strategy for North China*. Washington, DC.

⁶ In the PRC, class I water is "pristine," class II is "for high-value fish production areas and spawning habitats," class III is "suitable for urban water supply," class IV is "suitable for irrigation and recreation," and class V is "polluted."

⁷ International Symposium on Legislation for Environmental Damage Compensation, organized by EPRCC (of NPC) China University of Political Science and Law, and Center for Legal Assistance to Pollution Victims. Ford Foundation and Netherlands International Organization for Development and Cooperation, August, Beijing, 2004.

⁸ A Joint Seats Committee involving all key agencies meets at ministerial level and director-general level on a case-by-case basis. This mechanism would be used during the technical assistance to bring forward the relevant information.

local level for industry compliance. The complex institutional arrangements for water pollution control are in Appendix 1.

7. The World Bank is the largest development partner agency in water pollution control in the two areas and projects include (i) Huai River Pollution Control Project for Shandong and Anhui provinces, and (ii) Taihu Lake Pollution Control Project covering municipal sewerage systems and capacity building for Wuxi City and Changzhou City of Jiangsu Province. ADB has helped the Shanghai government to clean Suzhou Creek in TLB. The Netherlands Government has supported several programs to strengthen the capacity of the local government for water pollution control and management in Taihu Lake as well as in HRB since 1998. The United States Environmental Protection Agency is supporting a project in HRB in Tianjin, covering a comprehensive approach to control water pollution from municipal and industrial sources.

8. Many newspaper articles have reported water quality problems, studies have been done to analyze specific cases, and there is mounting web-based public comment; however, there are no comprehensive evaluations to understand the efficacy, efficiency, and sustainability of the environmental policies, plans, and investment programs in these areas. Under the Government's new scientific approach, such work can guide future policies and priorities.

III. THE TECHNICAL ASSISTANCE

A. Purpose and Output

9. The TA will make a comprehensive evaluation of the effectiveness of the policy framework and investment program during the 9FYP and 10FYP in HRB and TLB. The TA will have three major outputs: (i) a comprehensive evaluation report identifying performance compared with targets, and the necessary priority reforms and the phasing required for long-term control of water pollution; (ii) practical recommendations on legal, policy and institutional reforms, as well as financing and investment directions for river basin-based water pollution control; and (iii) an integrated and basin-based evaluation methodology suitable for use in other rivers and lakes, with related training materials and guidelines (Appendix 2).

B. Methodology and Key Activities

10. The methodology will be based on the Government's policies in general and the specific environmental plans for the two locations. The TA will take into account lessons from previous ADB-funded TAs and other studies and will assess international and domestic best practices and available methodologies.⁹ Seminars and training workshops for awareness and capacity building will be conducted at basin and local levels. The TA will undertake the following activities:

- (i) Review of HRB water pollution control and programs for 9FYP and 10FYP and the 9FYP and 10FYP Taihu Lake water pollution control and programs. The review will study plan accuracy and coverage to address the pollution load, financial requirements for implementation, staffing and institutional capacity, and EPB capacity to enforce the plans.

⁹ Lessons will be drawn from the ongoing ADB. 2002. *Technical Assistance to the People's Republic of China for the Study of Control and Management of Rural Nonpoint Source Pollution*. Manila (TA3891); and ADB. 2000. *Technical Assistance to the People's Republic of China for Transjurisdiction Environmental Management*. Manila (TA3588), both being implemented by SEPA. ADB. 2001. *Strategic Planning Study for the Preparation of the Yellow River Law*. Manila (TA3708), implemented by Ministry of Water Resources, is also relevant.

- (ii) Determine changes since 1996, for example: EPB response at province, city, or county levels to the load reduction plan; activities to tackle the most polluting cities and industries; new permits, closures; industry groups that reverted to cleaner production.
- (iii) Determine response of the municipality regarding sewage collection systems, treatment plants built, investments, financing sources, and monitoring of municipal pollution loads.
- (iv) Determine the Ministry of Agriculture (MOA) response to nonpoint source water pollution, and responses of other ministries.
- (v) Review investment intentions and achievements, pollution emissions, and efficiency of selected sites to identify the capacity of the new facilities to handle the pollution problem.
- (vi) Redo the 1995–1997 survey in the Huai River (part of the 2000 World Bank study) to measure changes over the baseline, and extend it to the TLB and cover municipal, nonpoint, and groundwater pollution. This will require coordination with the local governments (through EPBs), MOA, and the Ministry of Land and Resources.
- (vii) Review SEPA's performance in core responsibilities and in coordinating other agencies.
- (viii) Make a legal review of (a) the effectiveness of the legal and regulatory framework to control water pollution, and (b) resolution of water pollution disputes for victims to claim pollution remedies and compensation based on a survey of legal cases in HRB and TLB.
- (ix) Identify international best practices for river basin planning to control water pollution, measures for providing market-based incentives, economic measures and financing.
- (x) Develop a training handbook, and web site materials on principles and methods for evaluating water pollution control policies and practices in river and lake basins.
- (xi) Conduct two seminars at basin level (HRB and TLB) for planners and policy makers relating to a comprehensive and participatory river and lake water pollution control; two training workshops at county and city levels on participatory and comprehensive approaches to water pollution control.
- (xii) Develop a methodology for evaluating a policy for river- and lake basin-level water pollution.

C. Cost and Financing

11. The total cost of the TA is estimated at \$750,000 equivalent, comprising \$206,000 in foreign exchange and \$544,000 equivalent in local currency. It is proposed that ADB finance \$500,000 equivalent, consisting of the entire foreign exchange cost and \$294,000 equivalent in local currency cost. The TA will be financed on a grant basis by ADB's TA funding program. The Government will provide the balance of local costs, equivalent to \$250,000 to cover in-kind counterpart costs and services. Detailed cost estimates are in Appendix 3.

D. Implementation Arrangements

12. SEPA will be the Executing Agency for the TA. SEPA will prepare all relevant emissions and monitoring data and provide all relevant data from other participating agencies. The existing interagency coordination mechanism (footnote 8) will be used to ensure coordination. Relevant representatives from key agencies involved will be invited to attend the project workshops and seminars. An expert panel comprising 6–8 senior academics and officials will provide guidance to the TA consultants; panel members will be paid a lump sum honorarium. A TA management office (PMO) will be set up in SEPA to implement the TA. The PMO will be responsible for interdepartmental coordination within SEPA, especially the departments of policy and law, planning and budgeting, and pollution control. SEPA will assign an official to serve as a TA task manager. Counterpart staff will be responsible for day-to-day communications and will work closely with the TA consultants. SEPA will also provide office space and logistical support for TA implementation using counterpart funds.

13. The TA will be carried out over 12 months, starting in March 2005 and to be completed in March 2006. The TA will require 64 person-months of consulting services (8 international and 56 domestic). The international consultants will comprise (i) a water pollution control specialist-team leader, (ii) an emissions monitoring and evaluation specialist, and (iii) a permits systems specialist. The three should have extensive experience in the PRC and with best practices in water pollution control and planning in rivers and lakes. The domestic consultants will comprise an environmental specialist-deputy team leader, regulatory and policy specialist, legal specialist, institutional and planning specialist, environmental economist and investment specialist, water resources expert-hydrologist-water quality monitoring specialist, municipal sewerage specialist, and non-point pollution and rural specialist. Three survey teams will be engaged for (i) industrial pollution, (ii) municipal waste, and (iii) rural nonpoint source pollution that will require 6 person-months of domestic consulting services each (total of 18). The outline terms of reference are in Appendix 4.

14. Under an ADB pilot study,¹⁰ SEPA will select and engage an international consulting firm in association with domestic consultants on the basis of the quality- and cost-based selection method, in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for selecting and engaging domestic consultants. The simplified technical proposal procedure will be followed in engaging the consultants.

15. At the end of the first month, the consultants will submit to the Government and ADB an inception report and a seminar and workshop plan, which will be discussed in a tripartite review meeting (TRM). An interim report will be submitted to the Government and ADB at the end of the fifth month from the start of the TA, and the findings will be discussed in a seminar or workshop participated in by stakeholders, and subsequently in a second TRM. A draft final report will be submitted to the Government and ADB, 1 month before the end of the assignment, and will be presented by the consultant in the second national seminar. A third TRM, held before the conclusion of the TA, will discuss the draft final report. The recommendations from the second national seminar and the third TRM will be incorporated into the final report in English and Chinese (10 copies each), to be submitted to the Government and ADB at the end of the 12 months.

IV. THE PRESIDENT'S DECISION

16. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$500,000 on a grant basis to the Government of the People's Republic of China for the Evaluation of Environmental Policy and Investment for Water Pollution Control in the Huai River Basin and Taihu Lake Basin, and hereby reports this action to the Board.

¹⁰ ADB. 2003. *A Pilot Study for Delegation of Consultant Recruitment and Supervision under Technical Assistance to Executing Agencies*. Manila (Board Paper R157-03, dated 29 August 2003). The Government and ADB agreed to include this TA as one of the selected projects under the pilot study, approved by ADB. In particular, the Government agreed to follow the implementation procedures outlined in the pilot study Board paper and such other detailed procedures and practices as ADB may require. The Government acknowledges that the terms and conditions of the TA framework agreement between the Government and ADB, dated 23 December 1996, apply to this TA. Pursuant to Section 3.01 of the agreement, ADB will delegate consultant selection and supervision for firms under this TA to the Government. The TA Letter Agreement, to be issued under the TA framework agreement for this TA, will reflect this arrangement. Consultants engaged and supervised by the Government under this TA will have the status of experts performing missions for ADB as accorded by the provisions of the *Agreement Establishing the Asian Development Bank* and as further detailed in the TA framework agreement.

INSTITUTIONAL ASPECTS OF WATER POLLUTION CONTROL

1. Environmental management is complex and decentralized, with the provincial and local government environmental protection bureaus (EPBs) being responsible for implementing and enforcing environmental standards, rules, and regulations. The following are the institutional arrangements for water pollution:

- (i) The State Environmental Protection Agency (SEPA) has most of the responsibility for environmental management, covering brown and green issues, policy making and monitoring, nationwide standards and rules, and coordination of environment affairs across ministries. However, SEPA as a national body and the EPBs at provincial and lower levels for water pollution control, are only mandated to control urban industrial waste pollution. SEPA and EPBs do not have jurisdiction over other sources of water pollution coming from municipalities or agricultural wastes.
- (ii) The local government is responsible for municipal wastewater.
- (iii) The Ministry of Construction (MOC) has strong influence and responsibility in urban infrastructure development, including wastewater treatment and solid waste management.
- (iv) The Ministry of Agriculture (MOA) is responsible for non-point source pollution, including livestock and pesticide and fertilizer management. Since it is difficult to keep track of the rural industries (e.g., there are about 4.5 million enterprises within the Huai River basin), SEPA and EPB do not have accurate information. Hence if SEPA and the provincial EPBs monitor the main urban industries and compute the waste loads from urban areas, they keep track of only about 42% of wastewater. There is a large rural industry sector, rural municipal and livestock sector wastes that need to be estimated and entered into the waste load equation. For the Huai River, the World Bank team in 2001 computed figures almost 3–4 times higher than those reported by SEPA or the Ministry of Water Resources (MWR).
- (v) The Ministry of Land and Resources (MLR) is responsible for planning, administering, and utilizing natural resources such as land, and groundwater pollution.
- (vi) MWR has responsibilities for water allocation, soil and water conservation, watershed management, and withdrawal licensing.
- (vii) The State Forestry Administration (SFA) has significant responsibility related to forest and wetlands management, and biodiversity conservation.
- (viii) The National Development and Reform Commission (NDRC) has the mandate to control and regulate economic development planning, review and guides investment proposals, including pollution control projects.

2. In the two basins, the provinces concerned have primary responsibility for water pollution control to ensure that water quality within the provincial boundaries meets the targeted standards. SEPA is responsible for overall planning and monitoring of water pollution, supervision of programs implementation, and overall coordination of ministries and provinces. Since the beginning of the 9th Five-Year Plan, the institutional framework of the People's Republic of China has been strengthened, and is now far more capable of responding than was the case only a decade ago. A dialogue mechanism has been established whereby the Premier and other Cabinet members meet annually with SEPA officials to discuss the strategy for

environmental protection and sustainability.¹ However, serious weaknesses exist. A main limitation is weak collaboration across sectors, which is essential to make progress toward environmental goals. Mandates run across several agencies, often with unclear division of responsibilities. SEPA still has little influence on sectoral plans and policies. It has crosscutting mandates and needs to collaborate well to succeed in this role. However, turf battles and competition for funding make horizontal cooperation among agencies very difficult. Also, SEPA has a limited budget and staff resources, and has little direct influence over provincial budgets.

3. While river basin authorities were organized to address transjurisdictional issues related to the utilization of major river systems, the functional structure of those authorities primarily focuses on the construction of dams for hydroelectric power, flood control, bridges, and levees. The authority to address the causes and effects of water pollution is concentrated in the EPBs, resulting sometimes in conflicts among provinces, although the central Government may order the provincial EPBs to take necessary actions. In the absence of a dialogue mechanism among the concerned EPBs, the cause of the potential conflict is rarely removed or remedies instituted before conflict occurs.

4. SEPA-MWR formed a high level committee, but the work to bring compliance was delegated to local governments at all levels. However, local governments have insufficient incentive to do that, as effectively regulating polluters will directly reduce the income of the local governments. The EPBs are similarly affected in this way. There was no clear plan at the local level—emergency program, medium-term program, and long-term program—to make each industry comply. Water pollution control is SEPA's main function and SEPA needs to consider taking control of all provincial, city, and county EPBs to ensure that a rational compliance program is developed in industries and municipalities, and in agriculture. Clearly, funding has to be provided and all waste—industrial, municipal, and agricultural—needs to be part of the program.

¹ A Joint Seats Committee involving all key agencies meets at ministerial level and director-general level on a case-by-case basis. It can be convened when required. This mechanism can appropriately be used during the TA.

TECHNICAL ASSISTANCE PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
<p>Goal Improved control of water pollution in the Huai River basin (HRB) and Taihu Lake basin (TLB).</p>	<p>Pollution emission targets for the HRB and TLB are reasonable for the 11th Five-Year Plan (FYP), 2006–2010</p> <p>Control of water pollution in affected areas has improved.</p> <p>Emissions monitoring and reporting by State Environmental Protection Agency (SEPA) and environmental protection bureaus (EPBs) have improved</p> <p>Sewerage coverage and water treatment facilities are better planned, financed, coordinated under the 11FYP.</p> <p>Recommended policy evaluation methodology is applied in other river and lake basins.</p>	<p>Government monitoring indicators as used in the future under 11FYP and beyond</p> <p>Trends in pollution levels, water use efficiency, industry structure compared baseline survey (1995–1997)¹</p> <p>Government documents, reports</p>	
<p>Purpose Evaluation of HRB and TLB policy and investment framework for water pollution control in 9FYP and 10FYP.</p>	<p>Comprehensive report, recommendations, and methodology for future evaluation of water pollution control in other river and lake basins</p>	<p>Completed technical assistance (TA) report, seminar and workshop reports (4)</p>	<p>Government adopts practical, long-term approach to improve control of water pollution, and accepts reports from ongoing TA3588</p>

¹ The Chinese Research Academy for Environmental Sciences (CRAES) conducted a survey of industrial emission and wastewater volume in 1995 and 1997. But the survey did not cover contributions from other pollution sources. The project will review this baseline survey and design and conduct surveys (using mainly secondary data) for three types of wastewater: (i) industrial wastes including rural industries; (ii) municipal waste; and (iii) nonpoint source animal and agricultural and rural waste, including surface water and groundwater.

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
	“Observations and Suggestions” – summary policy report for national leadership	Completed paper in the People's Republic of China Resident Mission policy paper series; in Chinese language	(Transjurisdictional Environmental Management) and ongoing TA 3891 (Study on Control and Management of Rural Nonpoint Source Pollution) Improved coordination of agencies and budget resources available for future evaluations
<p>Outputs</p> <p>Evaluation report on 9FYP and 10FYP performance, priority reforms and the phasing required for long-term control of water pollution</p> <p>Recommendations on legal, policy, and institutional and financing reforms, as well as investment directions for river basin-based water pollution control</p> <p>Integrated and basin-based evaluation methodology suitable for use in other rivers and lakes</p>	<p>Evaluation report on impact of 9FYP, 10FYP, survey results, recommendations for 11FYP; summary policy report</p> <p>Improved monitoring (SEPA and EPBs), reform measures, and improved institutional coordination mechanism for 11FYP in the selected areas</p> <p>Evaluation methodology, and related training materials and guidelines</p>	<p>TA final report, policy summary (Chinese) and TA completion report; Government monitoring in 11FYP</p> <p>TA progress reports and completion report</p> <p>Intersectoral meetings and workshops</p> <p>Government reports, project reports</p>	<p>Evaluation findings, recommendations are accepted by the Government. Improved coordination among sector agencies, cities and provinces. Adequate Government budget resources and improved institutional capacity to apply the recommended evaluation methodology</p>
<p>Activities</p> <p>Review of HRB and TLB water pollution control plans for 9FYP and 10FYP.</p> <p>EPB and industry changes since 1996</p>	<p>Accuracy and feasibility of targets, achievements, levels and trends in emissions data</p> <p>Survey of EPB response to load reduction plan and targets, number of</p>	<p>TA progress reports</p> <p>TA review missions</p> <p>Tripartite review</p>	<p>SEPA provides accurate and comprehensive data on water pollution emissions and trends. Government agencies cooperate, and consultants can communicate well.</p>

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Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
Municipality-level response	permits and closures, industry responses Sewerage systems, treatment plants built, monitoring of emissions	meetings, TA reports TA reports	Major pollution sources are surveyed. Stakeholder participation is adequate.
Response of the Ministry of Agriculture, other agencies	Nonpoint pollution survey; activities by other agencies to reduce water pollution	TA reports	Necessary data are available on timely basis.
Review investment plans	Planned vs actual investments in water pollution control	TA reports	
Survey major polluters and accidents	Survey report, updating previous studies, e.g., updating or expanding 1995–1997 survey report for SEPA by CRAES (footnote 1)	Survey report updating trends and scenarios	
Review SEPA's performance	Review of effectiveness of SEPA's core roles and coordination function Recommendations on emissions monitoring for SEPA and EPBs	TA reports	
Conduct legal or judicial review	Review of (i) current legal framework and (ii) water pollution dispute resolution; practical recommendations	Court survey and TA report	
Identify best practices (BPs) for river and lake basin water pollution control	International and domestic BP measures, including regulations, market-based approaches, financing	TA reports	
Develop training handbook and web site materials	Modern management review and documents to train officials	Training materials	
Conduct two seminars at basin level and two training workshops	2 at river and lake basin levels, 2 at county and city levels	Completed workshops	

Continued on next page

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
Develop evaluation methodology	Comprehensive basin methodology, based on the results of the above work. Completed guidelines for application in other basins (e.g., Dianchi Lake, Hai River)	TA reports	
Inputs TA total cost International consulting services, including surveys Domestic consultants ADB contribution Government contribution	\$750,000 equivalent 8 person-[n1]months – evaluation design, best practices 56 person [n2]-months \$500,000 \$250,000 equivalent	Progress reports	Government provides adequate counterpart support.

COST ESTIMATES AND FINANCING PLAN
(\$)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank (ADB) Financing^a			
1. Consultants			
a. Remuneration and Per Diem			
(i) International Consultants (8 person-months)	176,000	0	176,000
(ii) Domestic Consultants (56 person-months)	0	180,000	180,000
b. International and Local Travel	12,000	15,000	27,000
c. Materials, Reports/Communications	0	8,000	8,000
2. Surveys ^b	0	39,000	39,000
3. Workshops and Seminars (including expert panel meetings)	0	12,000	12,000
4. Miscellaneous Administration and Support Cost	0	13,000	13,000
5. Contingencies	18,000	27,000	45,000
Subtotal (A)	206,000	294,000	500,000
B. Government Financing			
1. Counterpart Staff, Per Diem, and Travel	0	100,000	100,000
2. Office Accommodation and Equipment	0	50,000	50,000
3. Workshop/Seminar Expenses	0	20,000	20,000
4. Data Collection/Translation	0	15,000	15,000
5. Maps, Documents, and Reference Materials	0	10,000	10,000
6. Surveys ^b	0	55,000	55,000
Subtotal (B)	0	250,000	250,000
Total	206,000	544,000	750,000

^a Financed by ADB's technical assistance funding program.

^b The details of the costs would be identified.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE

1. The methodology to evaluate the environmental policy and investments in the Huai River basin (HRB) and the Taihu Lake basin (TLB) under the 9th and 10th Five-Year Plans (FYPs) will be based on the Government's environmental policies in general and the specific water pollution control plans and policies for the two locations. The technical assistance (TA) will take into account the findings of previous Asian Development Bank (ADB)-funded TAs and other studies and will assess best practices for water pollution control and methodologies for evaluating environmental policy.¹ The TA will have three major outputs on the HRB and TLB: (i) a comprehensive evaluation report identifying the necessary priority reforms and the phasing required for long-term control of water pollution; (ii) recommendations on legal, policy, and institutional reforms, and investment directions for river basin-based water pollution control; and (iii) an integrated, basin-based evaluation methodology suitable for use in other rivers and lakes.

2. Consulting services will total 64 person-months: 8 international, and 56 domestic inclusive of 18 to cover three surveys: industrial pollution, municipal waste, and non-point source pollution (6 person-months per survey).

A. International Consultants (8 person-months)

1. Water Pollution Control Specialist/Team Leader (5 person-months)

3. The consultant will take overall responsibility, assisted by a full-time deputy team leader. The consultant will review the 9FYP and 10FYP for Water Pollution Control and Programs. In addition (i) assess the previous national water pollution control programs and aid-funded projects; (ii) review the enabling environment, including the legal, policy, and regulatory framework, institutional arrangements, planning and programming procedures, investment and funding mechanism, and monitoring and evaluation; (iii) identify the key problems of water pollution control; (iv) using this analysis, develop a holistic approach to a comprehensive evaluation of the effectiveness of the existing policy framework and investment program; (v) prepare a detailed work plan for and agree on scheduled inputs, approaches, schedule and location of workshops, terms of reference for technical papers, and output and performance targets; (vi) in conjunction with the team and other stakeholders prepare a comprehensive evaluation report, including recommendations and advice to develop a long-term effective approach; (vii) evaluate feedback from stakeholder workshops and the advisory expert panel; (viii) prepare a short- to medium-term action plan comprising priority activities and policy reform recommendations in a suitable form for consideration by international and national funding agencies; and (ix) liaise with the ADB and the Government, and prepare reports and the final report in a form satisfactory to ADB and the Government.

2. Emissions Monitoring and Evaluation Specialist (1.5 person-months)

4. The specialist will be responsible for the following tasks: (i) systematically document existing water pollution emission data monitored mainly by the State Environmental Protection

¹ Lessons will need to be drawn from ongoing TA3891 (ADB. 2002. *Technical Assistance to the People's Republic of China for the Study on Control and Management of Rural Nonpoint Source Pollution*. Manila.) and ongoing TA3588 (ADB. 2000. *Technical Assistance to the People's Republic of China for Transjurisdiction Environmental Management*. Manila.), both of which are being implemented by SEPA. TA3708 (ADB. 2001. *Strategic Planning Study for the Preparation of the Yellow River Law*. Manila.), implemented by the Ministry of Water Resources, is also relevant. It is important that this TA draw on the findings from TA3708, as it is highly relevant to the Huai River and Taihu Lake basins.

Administration (SEPA) during the 9FYP and the 10FYP (1993–2004 to date), in particular the data for key years 1993, 1995, 1998, 2000; (ii) describe emission monitoring being undertaken by the environmental protection bureaus (EPBs) in terms of self-monitoring by industry, independent checking by EPB or EPB-authorized contractors; (iii) identify major pollutants, sources, and contributing percentages in different sections and analyze their trends; (iv) review the emission survey conducted in 1995–1997 by the Chinese Research Academy for Environmental Sciences (CRAES) and identify the gaps in monitoring rural industries, non-point source, and emissions from treatment plants and from tributaries; (v) based on the analysis, assess the effectiveness and weakness of the existing emission monitoring and reporting system, and identify the key problems and barriers to comprehensive monitoring; (vi) document and introduce best practices in water pollution monitoring at basin level, e.g., American and European practices; (vii) advise approaches and technologies to improve current monitoring and reporting; (viii) assess the training needs to improve SEPA's monitoring and reporting capacity; (ix) develop a framework and methodologies for periodic and comprehensive emission survey, including industrial, municipal, and agricultural; and (x) prepare a comprehensive report on monitoring and evaluation for incorporation in the draft final report.

3. Permits Systems Specialist (1.5 person-months)

5. Based on earlier studies performed for TA3588 Transjurisdictional Environmental Management (footnote 1), and work undertaken for the Yellow River Basin, a basic framework for waste discharge permits system for all wastes (industrial, municipal, and rural/animal wastes) has been designed. (i) Prepare an implementation program and propose institutional setup to implement the program of the permits system; (ii) prepare a framework plan for self and independent emission monitoring and describe the institutional arrangements for emission monitoring; (iii) prepare a framework plan for supervision and enforcement—staff, qualifications, and institutional arrangements; and (iv) propose funding arrangements by using permits charges, fees, and provincial and central government support.

B. Domestic Consultants (56 person-months)

1. Environmental Specialist-Deputy Team Leader (10 person-months)

6. The environmental specialist will work closely with the team leader and take overall responsibility for coordinating line agencies and local bureaus. The specialist should have comprehensive knowledge of national water pollution control. The specialist will have the following responsibilities: (i) prepare a comprehensive background report, including geographic description and maps, social and economic data, and hydrology; (ii) document basin water pollution control, including (a) an evaluation of existing environmental policies and options for the future; (b) the major problems, data, and trends over the 9FYP and 10FYP; (c) the major government programs and expenditures in these periods and evaluate the main constraints faced by those programs and their results; (d) existing institutional arrangements; (e) documentation of the current legal, regulatory, and policy framework; and (e) summary of aid-financed and national water pollution control projects; (iii) briefly set out the current status of data sets to reflect the pollution situation, trends, and problems; (iv) liaise with SEPA and other key relevant agencies to collect needed information and data; (v) work with the team leader to develop the working program for implementing the TA and to coordinate domestic consultants' responsibilities; (vi) liaise with SEPA and the local EPBs to organize field visits to sample sites; and (vii) perform other duties as required.

2. Regulatory and Policy Specialist (1.5 person-months)

7. The expert's responsibilities will include the following: (i) visit officials in charge of water quality management and water pollution control, and analyze root causes of river basin water pollution and whether these causes are rooted mainly in legislation, implementation of law or regulations, administration and policy, or other social factors; (ii) analyze the experience in establishing a pollution permits system, enforcing a pollution levy, and the net effect on pollution load emission control in 1996–2003; establish the relationship between pollution control efforts and water quality management² (iii) analyze the level of inadequacy of the current regulatory and policy framework against water pollution, and recommend ways to improve the regulatory and policy framework in particular, considering governors' responsibility, public participation in water pollution surveillance, survival of small and medium-size enterprises under stricter environmental regulations, polluters responsibilities, and mechanisms for solving pollution distribution; (iv) indicate the main issues and root causes of "super pollution" accidents, and mechanisms to avoid such accidents before they could occur; set up a framework for an emergency preparedness system for averting pollution accidents.

3. Legal Specialist (2.5 person-months)

8. The expert's responsibilities will include the following: (i) conduct a survey of judicial effectiveness of solutions to pollution disputes over all pollution legal cases both civil and criminal in the past 15 years (1990–2004) dealt with by People's Courts and People's Prosecutors' Offices (including Grassroots People's Courts, Intermediate People's Courts, Superior People's Court, and Supreme People's Court). The questionnaires must first be drafted by the legal specialist, in liaison with the regulatory and policy specialist; and finalized in consultation with team leaders and ADB's adviser on environmental law. The legal specialist will use her/his own good connection with People's Courts and the People's Prosecutors' Offices to conduct the survey and do statistical work; (ii) based on the judicial survey, complete a report on the PRC's judicial effectiveness in finding solutions to pollution disputes: (a) describe the effectiveness of the current judicial system in pollution dispute resolution, and pollution victims remedies and compensation; (b) if the current judicial system is ineffective in pollution legal cases, identify the root causes by examining the applied statute or law, or appeal procedures, litigation cost, or other factors of petitioners or judges; (c) propose recommendations for better protecting pollution victims, make recommendations on improving the effectiveness of the judicial system, with emphasis on issues of protection, scope of water pollution cases, litigation procedures for remedies, and joint compensation approaches; and (iii) develop the best approach for pollution victims in "super pollution" accidents to claim their remedy and compensation in the context of the current law situation and judicial system.

4. Institutional and Planning Specialist (4 person-months)

9. The consultant will take the following responsibilities: (i) review the authorities and responsibilities of the various institutions and organizations involved in water pollution management and identify any overlap or gaps in coverage of these mandates, plus any inconsistencies in policies or institutional arrangements, which may have been inadvertently introduced through this reform process; (ii) identify potential problems due to conflicting interests, priority setting and the clarification of financial responsibility for necessary investments and pollution control measures; identify constraints and opportunities for improving institutional

² In this regard, the previous reports of ADB TAs and SEPA of the PRC on water issues will be provided to the consultants.

arrangements for environmental monitoring and water pollution control; (iii) prepare a brief analysis of the level of staffing of relevant agencies, research institutes, and academics involved in water pollution control; (iv) design an incentive framework and system so that all players/stakeholders are involved in the process, and thus further integration of environment and economic development will occur, which is a major goal of the 11FYP; (v) review the experience of water pollution management in other countries (such as Australia, Canada, European Union, and United States), including an analysis of the use of those institutional arrangements, practices, and procedures in the PRC. Highlight the specific regulations and institutional arrangements that other river basins can learn for developing master plans on water pollution management; (vi) document the role of externally assisted projects in influencing institutional developments in water pollution control and environment management fields and the extent to which the introduction of international best practices has influenced policy and institutional settings in the PRC; and (vii) coordinate with the team leader and the legal specialist in the institutional aspect, and prepare a comprehensive report on institutional analysis for incorporation in the draft final report and final report.

5. Environmental Economist and Investment Specialist (6 person-months)

10. The expert will have the following responsibilities: (i) document the major national and international water pollution control projects and their expenditure during the 9FYP and 10FYP periods and summarize the investment in water pollution control, in terms of different sources and targets; (ii) analyze the cost and benefit effectiveness of a sample of major water pollution control projects financed by the government and aid agencies; (iii) evaluate the economic losses caused by various water pollution sources; (iv) review economic and social factors; (v) analyze the environmental effectiveness of current production units; (vi) identify the limitations and barriers to an effective and sustainable financing system and recommend mechanisms and approaches, including permits, trust funds, budgeting, and financing arrangements; and (vii) from other TA reports (e.g. footnote 1) and related best practice experience, examine the options for greater use of market-based approaches in the 11FYP for water pollution control.

6. Water Resources Expert/Hydrologist/Water Quality Monitoring (6 person-months)

11. The expert's responsibilities will cover the following: (i) document basic information on water resources, including the volume and its dynamic status, flooding control system, water reallocation, agricultural irrigation, and groundwater issues; (ii) report on the major water engineering projects and their influence on water pollution in the basins; (iii) review the existing water quality monitoring systems conducted mainly by SEPA and the Ministry of Water Resources (MWR); (iv) systematically document existing water pollution data reported mainly by SEPA and MWR during the period of the 9FYP and the 10FYP (1993–2003), (v) identify major pollutants, sources, and contributing percentages in different sections and analyze their trends; (vi) prepare a comprehensive report on the two basins water pollution situation, including industrial, municipal, and rural distribution; (vii) analyze structural and nonstructural problems in monitoring and reporting; (viii) review the survey conducted in 1995 by the CRAES and SEPA and suggest an integrated approach for a new emission survey; (ix) detail methodologies and approaches to improve the current monitoring and reporting; and (x) prepare a technical approach to incorporate monitoring of load and flux.

7. Municipal Sewage Expert (4 person-months)

12. The municipal expert will have the following duties: (i) prepare a background report on

the municipal sewage situation, including the local sewerage capacity, contribution, and major pollutants and their percentages; (ii) review the current sewage treatment and monitoring by the construction agency and the linkage with SEPA's monitoring; (iii) document the data on emissions from municipal sewerage, and evaluate the distribution, trends, and problems; and (iv) perform other duties as required.

8. **Non-Point Pollution and Rural Expert** (4 person-months)³

13. The expert will (i) prepare a report on rural industry pollution and agricultural non-point source pollution, including volume, percentages, weight, and regional impacts; (ii) assess the capacity of the current monitoring system for agricultural and rural industrial pollution; (iii) develop an integrated methodology to calculate emissions from agricultural and rural industries; (iv) advise on a comprehensive approach to incorporate the agricultural and rural contribution with urban industrial and municipal sewerage; and (v) work with the Ministry of Land and Resources (MLR) to describe their monitoring system and data trends for groundwater quality and pollution.

9. **Survey Groups** (18 person-months)

14. The CRAES conducted a survey of industrial carbon oxide emission and wastewater volume in 1995 and 1997. But the survey did not cover contributions from other pollution sources. The survey groups will review this initial survey and design, and updated it through surveys (using mainly secondary data) of three types of wastewater: (i) industrial wastes including those from rural industries, (ii) municipal waste, and (iii) non-point source pollution and rural waste. The responsibilities of the groups will include the following:

- (i) **Industrial pollution assessment** (6 person-months). (a) Review the methodology applied in the 1995–1997 survey and data sources to support the work; (b) develop a comprehensive methodology for a new survey using mostly secondary data for industrial emissions including those from rural industries; (c) liaise with SEPA and local EPBs and conduct the survey; and (d) prepare a report, including analysis of contribution, status, and trends of various sources and suggestions for monitoring and reporting.
- (ii) **Municipal waste assessment** (6 person-months). (a) Develop a comprehensive methodology for a survey using mostly secondary data for municipal waste emissions, including rural and small cities; (b) liaise with local governments, SEPA, and local EPBs and conduct the survey; (c) prepare a survey report, including the analysis of various source contributions, status, and trends and suggestions for the monitoring and reporting.
- (iii) **Non-point source pollution assessment** (6 person-months). (i) Develop a comprehensive methodology for a survey using mostly secondary data for non-point source waste emissions from large animal concentrations and from rural and small cities; and prepare a model and verify the amount of non point source waste that enters the rivers; (b) liaise with local governments, SEPA, and local EPBs and conduct the survey; (c) prepare a survey report, including the analysis of contribution, status, and trends of various sources and suggestions for monitoring and reporting; and (d) liaise with MLR for groundwater monitoring and quality assessment data and trends.

³ This work will build on the findings and data used in TA3891 (footnote 1).