ASIAN DEVELOPMENT BANK

TAR:PRC 34473

TECHNICAL ASSISTANCE

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR PREPARING THE

HENAN WASTEWATER MANAGEMENT PROJECT

December 2003

CURRENCY EQUIVALENTS

(as of 30 November 2003)

Currency Unit	–	yuan (CNY)
CNY1.00	=	$0.1208
$1.00	=	CNY8.277

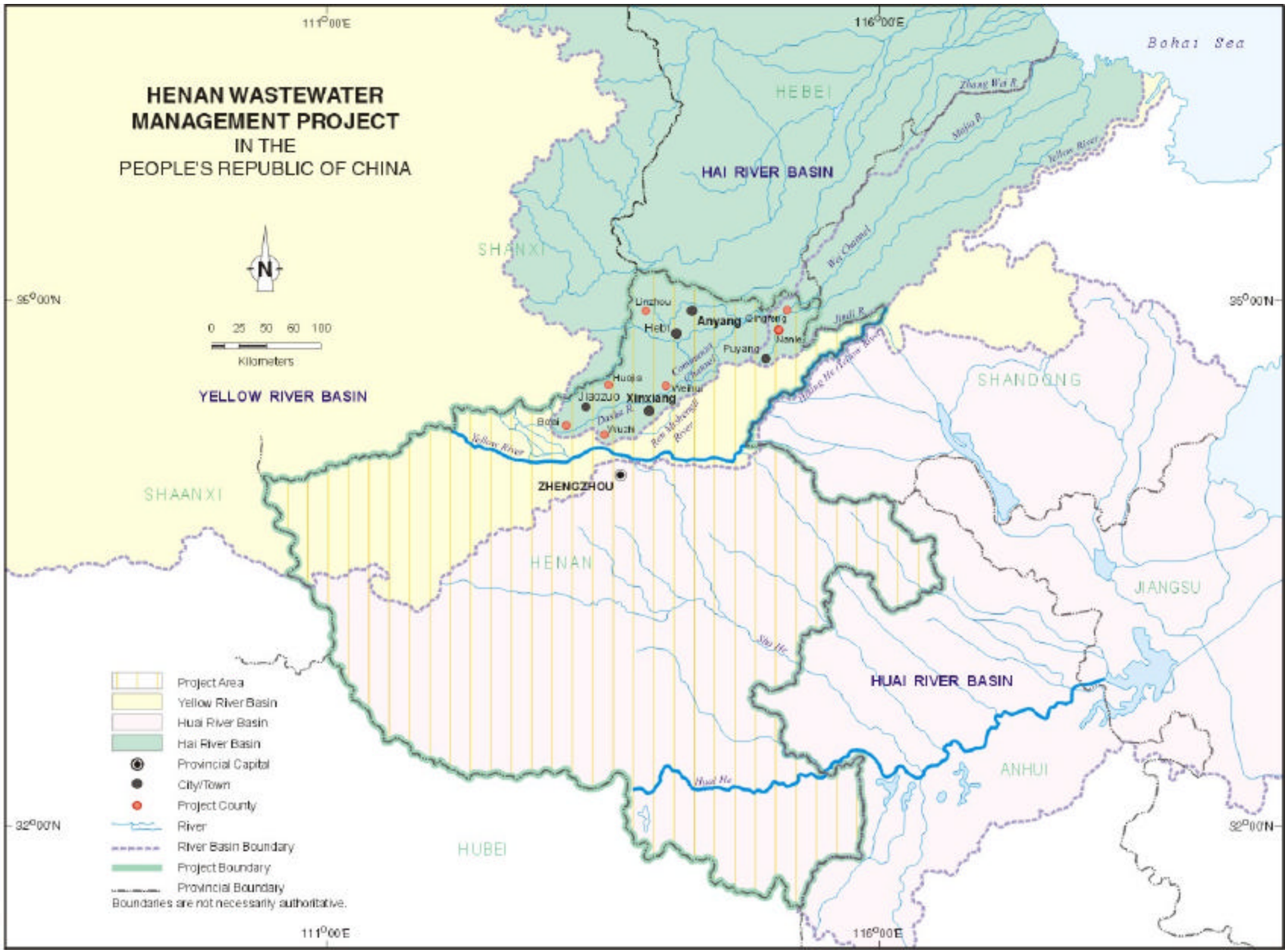
ABBREVIATIONS

ADB	–	Asian Development Bank
EIA	–	environmental impact assessment
HPG	–	Henan provincial government
HRB	–	Hai River Basin
MWC	–	municipal wastewater company
O&M	–	operation and maintenance
PLG	–	project leading group
PMO	–	project management office
PRC	–	People's Republic of China
SEPA	–	State Environmental Protection Administration
SNWTP	–	South-North Water Transfer Project
TA	–	technical assistance
WWTP	–	wastewater treatment plant

NOTES

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

This report was prepared by I. Keum.


HENAN WASTEWATER MANAGEMENT PROJECT
IN THE
PEOPLE'S REPUBLIC OF CHINA
N
0 25 50 60 100
Kilometers
YELLOW RIVER BASIN
HAI RIVER BASIN
HUAI RIVER BASIN
Bohai Sea
HEBEI
SHANXI
SHAANXI
SHANDONG
HENAN
JIANGSU
ANHUI
HUBEI
ZHENGZHOU
Linzhou
Anyang
Hebi
Qinghe
Puyang
Nanle
Huojia
Jiaozuo
Xinxiang
Weihui
Boai
Yuzhi
Project Area
Yellow River Basin
Huai River Basin
Hai River Basin
Provincial Capital
City/Town
Project County
River
River Basin Boundary
Project Boundary
Provincial Boundary
Boundaries are not necessarily authoritative.
111°00'E
116°00'E
35°00'N
32°00'N

I. INTRODUCTION

1. The Government of the People's Republic of China (PRC) had requested technical assistance (TA) from the Asian Development Bank (ADB) to help prepare the Henan Wastewater Management Project. The Fact-Finding Mission visited the project area in September 2003; discussed technical and socioeconomic issues with representatives of the central, provincial, and municipal governments; and carried out an initial poverty and social assessment and a rapid environmental assessment. This paper is based on the understandings reached by the Government and Mission on the TA objectives, scope, terms of reference, cost estimates and financing plan, and implementation arrangements. The TA is included in ADB's country program for 2003.[1]

II. ISSUES

2. Rapid economic growth and continuing urbanization is resulting in increasingly severe problems related to water shortage and pollution, especially in northern PRC. Interruptions of water supply caused by water shortages are growing in magnitude and frequency, hampering domestic consumption, urban industry, and irrigated agriculture, creating severe economic losses. To solve these problems, the Government is implementing a major scheme to transfer water from the Yangtze River to northern PRC—the South-North Water Transfer Project (SNWTP).[2]

3. Of the total river length in northern PRC, 68% is classified as unsuitable as raw water for drinking water, and half the groundwater sources are polluted. The Hai River Basin (HRB), which covers Beijing and Tianjin; most of Hebei Province; and parts of Henan, Shandong, and Shanxi provinces, is one of the three most polluted river systems,[3] with more than 80% of the river reaches classified as polluted. The main rivers in the basin are polluted by domestic, industrial, and agricultural wastewater. The polluted surface water contaminates groundwater sources, on which most residents depend for drinking water. Surface- and groundwater pollution are also a public health problem. The Huai River Basin, which covers parts of Henan, Anhui, Jiangsu, and Shandong, is similarly polluted. Pollution is a growing constraint on economic growth.

4. The Government is working to reduce pollution in the Hai and Huai river basins. ADB has helped the Government refine its strategic plans for overall management of HRB.[4] The Government's efforts have focused on large industrial sources in the provincial cities of Beijing and Tianjin, and major cities in Hebei Province, which have launched large-scale wastewater treatment plant construction programs. Despite considerable reduction of pollution from these sources, water quality has continued to deteriorate, indicating that many other sources are contributing to water pollution. Reduction of pollution and/or discharges from secondary cities is essential to improve water quality.

5. Nonpoint water pollution due to fertilizer and pesticide runoff, and discharges from intensive animal production is worsening. Nonpoint sources of nutrients are significant sources of eutrophication in many lakes throughout the PRC and also in shallow near-shore marine

[1] The TA first appeared in *ADB Business Opportunities* in May 2002.
[2] This scheme comprises the eastern, central, and western routes. The eastern and central routes have started construction, with a completion target by 2010.
[3] The others are the Huai and Liao river systems.
[4] ADB. 1998. *Technical Assistance to the People's Republic of China for the Hai River Basin Wastewater Management and Pollution Control*. Manila.

areas that experience limited tidal flushing. Bohai Bay is susceptible to eutrophication as indicated by the frequent occurrence of red tide. ADB has helped the Government address nonpoint water pollution control at a policy level.[5]

6. The State Environmental Protection Administration (SEPA) formulated the Tenth Five-Year Plan of Water Pollution Prevention and Control in HRB (2001–2005). The plan identified several key actions: (i) reduce the gross amount of pollutants, (ii) protect drinking water source areas, and (iii) solve transboundary water pollution disputes.[6] The strategy's fundamental parts include integration of municipal and industrial wastewater treatment and establishment of effective wastewater enterprises with sound cost recovery to ensure sustainable facility operations and to contribute to capital investment. To solve similar water pollution issues in the Huai River Basin, SEPA also formulated the Huai River plan. Pollution control as part of water resources management is a top priority in the Tenth National Five-Year Plan.

7. Henan covers the upper parts of the Hai and Huai river basins, and the lower part of the Yellow River Basin. The northern part of Henan within HRB includes the secondary municipalities of Anyang, Jiaozuo, Puyang, and Xinxiang. The main rivers in this part of the basin flow into the Wei River and Zhangweinan Canal, and then eventually into Bohai Bay. Like other parts of HRB, this sub-basin is severely polluted. Water in the Hai and Huai river basins does not meet the minimum standards as a raw water source for drinking water or even for agricultural use. Pollution control is of particular importance due to the relevance of the watercourse to boundary disputes between Henan, Hebei, and Shandong, mainly caused by upstream pollution and the planned use of the watercourse as part of SNWTP's eastern route.

8. The major factors in the rapid deterioration of surface and groundwater quality are ineffective regulatory control of municipal and industrial wastewater discharges, inadequate water resources management, and financial weakness of municipal service providers. Demand for water for domestic and industrial use has steadily increased, putting more pressure on water resources. Wastewater, and its associated pollution loads, has increased rapidly. Only a small proportion of wastewater flows are treated to comply fully with discharge standards, largely the result of ineffective enforcement of environmental regulations and inadequate environmental infrastructure investment.

9. The Henan provincial government (HPG) has thus formulated the Henan Hai and Henan Huai river plans. Both require all municipalities to have at least one wastewater treatment plant by 2005, and all counties to have at least one wastewater treatment plant by 2007. Both plans also require all municipalities to establish wastewater companies and introduce wastewater tariffs before building wastewater treatment plants. ADB has played a leading role in helping the PRC formulate national wastewater tariff guidelines.[7] In the PRC, a wastewater tariff can be introduced once a project proposal to construct a wastewater treatment plant is approved. Wastewater tariffs are applied in the four representative project municipalities. Tariff levels[8] are not enough for future debt service or for operation and maintenance of project facilities. Tariffs will be adjusted to implement the ensuing project and to ensure that the poor can access the

[5] ADB. 2002. *Technical Assistance to the People's Republic of China for Nonpoint Source Water Pollution Control*. Manila.

[6] ADB. 2000. *Technical Assistance to the People's Republic of China for Transjurisdiction Environmental Management.* Manila.

[7] ADB. 2001. *Technical Assistance to the People's Republic of China for National Guidelines for Urban Wastewater Tariffs and Management Study.* Manila.

[8] Current wastewater tariff levels as established by HPG are CNY0.6 per cubic meter (m^3) for domestic wastewater, CNY0.7/m^3 for wastewater from industry, and CNY0.8/m^3 for wastewater from specific commercial uses.

improved services. Both plans require all industries to meet national effluent discharge standards.[9]

10. To achieve construction targets, 23 county-level projects in five municipalities are proposed in the Henan Hai River plan. Of the 23 projects, 6 are being implemented with national funds, 7 in four municipalities are proposed for ADB financing under the ensuing project, and the remaining 10 will be implemented with other domestic financing sources. The projects for ADB financing were selected based on the relevance and importance of the projects to the Henan Hai River plan, financial and institutional capacity of the concerned municipality to implement the projects, and preparedness of the projects. The municipalities prepared preliminary feasibility studies. For industrial pollution control, 49 industrial wastewater treatment projects proposed in the Henan Hai River plan are in progress with domestic financing sources. Additional projects may be identified for the Henan Huai River plan.

11. The initially identified projects will help the governments of Anyang, Jiaozhou, Puyang, and Xinxiang municipalities formulate more effective regulatory control of municipal and industrial wastewater discharges, and introduce the principle of integrated water resources management and pollution control. The projects will help improve the quality of surface and groundwater in and downstream of the project municipalities, and urban environment and public health through improved wastewater management. The projects will also help improve the quality of life for the urban poor by reducing waterborne diseases, safeguarding the quality of drinking water, and improving wastewater services.

12. Most Henan municipality government public utility bureaus and/or urban construction bureaus are responsible for municipal sewerage and wastewater treatment. In anticipation of the ensuing project, the project municipalities have established wastewater companies. Their ultimate goal is to operate as autonomous state-owned enterprises, with their own boards of directors, and to control all income received from wastewater tariffs.

13. One of ADB's strategic objectives in the PRC is to enhance environmental protection and natural resources management. The ensuing project is consistent with ADB's strategy. The project will improve living conditions and the health of the people of Henan, and enhance water resources management in the Hai and Huai river basins to improve the environment for sustainable long-term economic growth. Related policy dialogue is being pursed in the following areas: (i) integrated water resources management for groundwater resources and irrigation requirements, (ii) transboundary pollution control, (iii) integrated domestic and industrial wastewater management, (iv) solid waste management in the context of groundwater pollution, (v) regulatory enforcement and monitoring, (vi) enterprise reform and corporate governance, (vii) cost recovery and tariff reform, and (viii) private sector participation.

14. ADB has been involved in water resources management and pollution control in HRB since 1992. ADB has financed nine PRC water supply and wastewater management projects with a total loan of $1,085 million since 1993. Two have helped improve wastewater management in Hebei Province and Tianjin. ADB has provided two advisory TAs[10] for water

[9] During the Ninth National Five-Year Plan, all industries were required to treat their wastewater to national effluent standards by 31 December 2000. About 90% of the industries reportedly complied. However, the actual figure could be lower than this due to ineffective regulatory control.

[10] ADB. 1992. *Technical Assistance to the People's Republic of China for Haihe Basin Environmental Management and Planning Study*. Manila; and ADB. 2002. *Technical Assistance to the People's Republic of China for Study of the Carrying Capacity of Water Resources*. Manila.

resources management and planning for HRB, and carrying capacity of water resources to determine the quantity and quality of the river flows needed to maintain the ecology and environment. The project will complement these efforts in formulating policy and designing investment programs based on an integrated approach to water and environmental management.

III. THE TECHNICAL ASSISTANCE

A. Purpose and Output

15. The purpose of the project preparatory TA is to help the Government prepare an investment project for wastewater management and pollution control in Henan, covering, among others, Anyang, Jiaozuo, Puyang, and Xinxiang. The output will be workshops and a series of reports recommending a project suitable for ADB financing. The TA framework is in Appendix 1.

B. Methodology and Key Activities

16. The TA will assess the feasibility of the seven representative projects in HRB, which were proposed by HPG for wastewater collection, treatment, and disposal through a review of sewerage master plans, industrial wastewater pollution control plans, domestic feasibility studies, environmental impact assessment reports, resettlement plans, and related studies. The TA will develop selection criteria for additional similar projects in the Huai and Yellow river basins in Henan, and prepare a list of indicative projects to be implemented under the project. The TA will also identify policy measures and institutional development needs that will improve wastewater services; ensure financial sustainability; and identify the social dimensions to be incorporated in the project design, including measures proposed to enhance social development and reduce poverty. The initial poverty and social assessment carried out during the Mission for the representative projects is in Appendix 2. Key TA activities will include field surveys; documents review; data analysis; and consultation with stakeholders, including government officials, project beneficiaries, and affected people.

C. Cost and Financing

17. The total cost of the TA is estimated at $1 million equivalent, comprising $550,000 in foreign exchange costs and $450,000 equivalent in local currency costs. The Government has requested that ADB finance $800,000 equivalent, covering the entire foreign exchange cost, and $250,000 equivalent of the local currency cost. The TA will be financed on a grant basis by ADB's TA funding program. The Government has agreed to provide the balance of local currency cost, equivalent to $200,000 for counterpart staff, office space, furniture, administrative support services, and logistics. Details of the cost estimates and financing plan are in Appendix 3. The Government has been informed that approval of the TA does not commit ADB to financing any ensuing project.

D. Implementation Arrangements

18. HPG will be the project Executing Agency. A project management office (PMO) will be established, and the director of the HPG Environmental Protection Bureau will be the PMO director. PMO staff will come from the HPG Financial Bureau, Planning Commission, and Construction Department. The PMO will be in charge of overall project coordination, and will cooperate with the consultants and ADB. Project municipalities will establish similar project management offices. A project leading group (PLG)—composed of the Henan vice governor;

staff from the HPG Environmental Protection Bureau, Financial Bureau, Planning Commission, and Construction Commission; and project municipality vice mayors—will be formed to guide and support the project. The PMO will be the PLG's secretariat.

19. A firm of international consultants, in association with domestic consultants, will be engaged by ADB in accordance with its *Guidelines on the Use of Consultants by ADB and its Borrowers,* based on the quality- and cost-based selection method and other arrangements satisfactory to ADB for the engagement of domestic consultants. The TA will require 45 person-months of consulting services—18 person-months international and 27 person-months domestic. The international consultants will have expertise in wastewater management, environment, social analysis, financial analysis, and economic analysis. The domestic consultants will have expertise in engineering services (wastewater management, sewer network, costing, mechanical, electrical, and instrumentation); environment; sociology; financial analysis; and economic analysis. The outline terms of reference for consulting services are in Appendix 4. Since the tasks and methodology are well defined, engagement of consultants will follow the simplified technical proposal procedure.

20. The TA will be implemented over 6 months, from March to August 2004. The consultants will submit inception, interim, draft final, and final reports. The findings will be presented at interim and draft final workshops. PLG members; representatives of the Ministry of Finance, municipal governmental agencies, and local communities; and ADB staff will participate in the workshops.

IV. THE PRESIDENT'S DECISION

21. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $800,000 on a grant basis to the Government of the People's Republic of China for preparing the Henan Wastewater Management Project, and hereby reports this action to the Board.

PRELIMINARY PROJECT FRAMEWORK[1]

Design Summary	Key Performance Indicators and Targets	Project Monitoring Mechanisms	Key Assumptions and Risks
Goal (long-term development objective)			
Improve urban environment and water quality of Henan Province	Public satisfaction with the urban environment increases from xx% to yy% (to be quantified when baseline established) All relevant water bodies in Henan meet targets by 2010	Annual socioeconomic surveys undertaken as part of a project performance management system Environmental monitoring data of local environmental protection bureaus and State Environmental Protection Administration	
Promote socioeconomic development	Increased economic growth	County-level socioeconomic data on gross domestic product and per capita income	
Purpose (immediate development objective)			
Increased coverage of urban wastewater systems in Anyang, Jiaozuo, Puyang, and Xinxiang municipalities	Linzhou City in Anyang: xx% of urban wastewater will be intercepted in sewers and treated at the wastewater treatment plant (WWTP). Bo Ai and Wuzhi counties in Jiaozuo: xx% and yy%, respectively, of urban wastewater will be intercepted in sewers and treated at WWTPs. Nanle and Qingfeng counties in Puyang: xx% and yy%, respectively, of urban wastewater will be intercepted in sewers and treated at WWTPs. Huojia and Weihui counties in Xinxiang: xx% and yy%, respectively, of urban wastewater will be intercepted in sewers and treated at WWTPs.	Municipal wastewater company (MWC) information systems Progress reports prepared by MWCs Asian Development Bak (ADB) review missions ADB project completion report	Increase in sewerage flows exceeds demand estimates. Improved water quality management by local governments is effective and will be sustained.
Enterprise reform of MWCs	Management and financial autonomy of MWCs is achieved by all project cities by 2007.	Legal status and audited financial statements	The Government resists institutional reform.

[1] This refers to the ensuing investment project, not the TA itself.

SUMMARY INITIAL POVERTY AND SOCIAL ANALYSIS REPORT FORM

A. Linkages to the Country Poverty Analysis

Sector identified as a National Priority in Country Poverty Analysis? Yes	Sector identified as a National Priority in Country Poverty Partnership Agreement? Yes
Contribution of the sector/subsector to reduce poverty in the People's Republic of China: Although the project will not be a direct poverty intervention, it will help reduce poverty by (i) promoting sustainable economic development; (ii) cleaning up urban waterways, which will improve urban living conditions and public health; (iii) improving water quality and environmental health conditions in downstream waterways; and (iv) ensuring introduction of social tariffs for beneficiaries below defined poverty lines.	

B. Poverty Analysis — Proposed Classification : Non-core poverty

What type of poverty analysis is needed?

The poverty analysis will do the following:

(i) Identify how the project relates to national priorities as identified in the country poverty analysis, and in the poverty partnership agreement.
(ii) Identify project beneficiaries and affected people (particularly poor and vulnerable groups), and possible barriers to their participation in and benefit from the ensuing project.
(iii) Assess the effects of the project in stabilizing or reducing industrial unemployment following closure of enterprises that cannot comply with environmental regulations.
(iv) Assess the effects of the ensuing project on downstream beneficiaries of improved surface and groundwater quality, including use for water supplies, irrigation, and industry.
(v) Assess the effects on farmers and fish farmers of land acquisition for wastewater treatment plant sites.
(vi) Assess the availability of temporary and permanent employment in construction and operation of the sewerage systems and wastewater treatment plants.
(vii) Assess the affordability of the proposed wastewater tariffs.

C. Participation Process

Stakeholder Analysis: Main stakeholders include national, provincial, municipal and county government departments and officials; officers of municipal wastewater companies; project beneficiaries (downstream water users, urban residents); and project-affected people (farmers and fish farmers). Further stakeholder analysis will be developed during technical assistance (TA) implementation.

Participation strategy required: Yes. The strategy will incorporate consultation during the environmental impact assessment, a resettlement plan, workshops, surveys, and public consultation.

D. Potential Issues

	Significant/ Not Significant/ Uncertain / None	Strategy to Address Issues	Plan Required
Resettlement	Significant	A consolidated resettlement plan will be prepared based on the individual resettlement plans for project counties.	Full resettlement plan
Gender	Not significant	Gender assessment will be included as part of the social assessment.	Yes (in social impact assessment)
Affordability	Not significant	Not deemed to be a major concern, but it will be assessed further during the project preparatory TA (PPTA).	Yes (in social impact assessment)
Labor	Not significant	No labor retrenchments are envisaged as a result of the ensuing project, but will be assessed further during the PPTA.	Yes (in social impact assessment)
Indigenous People	None	No minority nationalities will be affected or impacted by the ensuing project.	No
Other Risks/ Vulnerabilities	Not significant	No other social risks are anticipated as a result of the ensuing project.	No

COST ESTIMATES AND FINANCING PLAN

($'000)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing[a]			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	402.0	0.0	402.0
ii. Domestic Consultants	0.0	129.0	129.0
b. International and Local Travel	25.0	18.0	43.0
c. Reports and Communications	5.0	10.0	15.0
2. Equipment and Software[b]	15.0	0.0	15.0
3. External Experts Review[c]	0.0	4.0	4.0
4. Miscellaneous Administration and Support Costs[d]	0.0	33.0	33.0
5. Representative for Contract Negotiations[e]	5.0	0.0	5.0
6. Contingencies[f]	98.0	56.0	154.0
Subtotal (A)	**550.0**	**250.0**	**800.0**
B. Government Financing			
1. Office Accommodation and Transport[g]	0.0	80.0	80.0
2. Remuneration and Per Diem of Counterpart Staff	0.0	50.0	50.0
3. Translation of Documents	0.0	40.0	40.0
4. Workshops	0.0	20.0	20.0
5. Others	0.0	10.0	10.0
Subtotal (B)	**0.0**	**200.0**	**200.0**
Total	**550.0**	**450.0**	**1000.0**

[a] Financed by ADB's TA funding program.
[b] Computer(s), printer(s), and office equipment.
[c] Includes two experts to review and discuss the consultants' reports during the workshops.
[d] Translation of technical assistance reports ($6,000), interim and final workshops ($9,000), and interpreter ($18,000).
[e] Includes cost of travel and per diem for government observers for contract negotiations.
[f] Includes social and resettlement surveys.
[g] In-city travel.
Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTING SERVICES

A. Review of Sector Development Plans

1. The consultants will review long- and medium-term plans for water resources management and pollution control in the Hai River Basin (HRB), focusing on the part of Henan Province within the basin, and downstream beneficiaries. Among others, reference will be made to the Henan Hai River plan, which is part of the Tenth Five-Year Plan of Water Pollution Prevention and Control in HRB (2001–2005) The consultants will also refer to consultants' reports prepared under the Asian Development Bank (ADB) advisory technical assistance (ADTA).[1] Based on the review of these plans, the consultants will assess Henan provincial government (HPG) policies and strategies for water resources management and pollution control to ensure that a comprehensive approach has been adopted throughout the river basin, and all appropriate options have been considered on a least-cost basis. The consultants will recommend any changes in policies and strategies, and improvements to these plans as a consequence of the recommended changes in policies and strategies.

2. The consultants will analyze wastewater management practice in representative project municipalities in the context of basin-wide water resources management, including water supply, irrigation, and industrial use. Reference will be made to sewerage master plans, industrial wastewater pollution control plans, and various feasibility studies, where these exist, among others. Based on the analysis, the consultants will recommend improvements to these plans, including policies and strategies for wastewater management. The representative projects will be evaluated in the context of these plans. Based on the evaluation, the consultants will undertake technical, environmental, social, financial, economic, and institutional feasibility studies of the representative projects.

3. For the Huai and Yellow river basins, the consultants will conduct a similar exercise for the additional projects to be included under the project. For the Huai River Basin, reference will be made to the Henan Huai River plan, among others, which is the implementation plan for the Huai River plan. Based on the initial exercise, the consultants will develop selection criteria for the additional projects and prepare a list of indicative projects to be implemented under the project.

B. Technical Aspects

4. The consultants will review domestic project proposals, feasibility studies, environmental assessments, and resettlement plans for all the representative projects, and other related reports used to substantiate the analyses of the feasibility studies. Major water users and major effluent discharges will be identified to evaluate the overall environmental impacts and benefits of the representative projects. The findings of the domestic feasibility studies will be confirmed and/or modified, as required. Where details are lacking, the consultants will carry out the necessary studies.

5. The consultants will undertake the following tasks:

(i) Develop plans to connect existing sewers to future project treatment facilities, including coordination and phasing schedules to complete the sewer network, and a financing strategy.

[1] ADB. 2002. *Technical Assistance to the People's Republic of China for Nonpoint Source Water Pollution Control*. Manila; and ADB. 2000. *Technical Assistance to the People's Republic of China for Transjurisdiction Environmental Management.* Manila.

(ii) Estimate wastewater flows and plant capacity, including flexibility to accommodate future changes in flow rate.
(iii) Confirm treatment process, including flexibility to accommodate future changes in treatment requirements, and suitability for effective treatment of pretreated wastewater discharged by industry, sludge treatment and disposal, effluent standards, potential for effluent reuse, and impact of wastewater collection and treatment on water quality in the receiving watercourses.
(iv) Develop design criteria and standards for wastewater collection and treatment, outline designs, and stage construction; and verify the planning horizon for project facilities and other facilities that will interface with.
(v) Estimate quantities of major civil works items and schedules of major items of plant and equipment, including instrumentation and control systems.
(vi) Develop unit rates for civil works items, manufacturers' budget quotations for major plant items, and detailed construction cost estimates (by foreign exchange cost and local currency cost), following ADB guidelines and standards. The consultants should use costing models incorporating ADB's requirements for physical and price contingencies and interest during construction.
(vii) Prepare detailed financial plans and disbursement schedule, implementation schedule, and propose procurement packages in accordance with the *Guidelines for Procurement under ADB Loans*.
(viii) Prepare commissioning procedures and operation and maintenance (O&M) manuals, staffing requirements for O&M, and cost estimates for O&M.
(ix) Develop environmental monitoring systems for influents entering sewer collection systems and wastewater treatment plants to protect the biological processes from toxic wastes.
(x) Estimate consulting services inputs needed for project implementation, including institutional strengthening and development, engineering design, and construction supervision over the project implementation period.
(xi) Develop a draft project administration memorandum in accordance with ADB's guidelines.

C. Environmental Impact Assessment

6. The consultants will review and update the environmental impact assessment and prepare a summary environmental impact assessment (EIA) with appropriate environmental monitoring and management plans, following ADB guidelines.

7. The consultants will accomplish the following tasks:

(i) Review the domestic EIA for each representative project and the rapid environmental assessment during technical assistance (TA) preparation to ensure they conform to ADB's *Environmental Policy, 2002 and Environmental Assessment Requirements and Environmental Review Procedures*. The consultants will help HPG carry out further investigations and analysis, as required, and finalize the EIA, management plan, and monitoring plan by incorporating comments from ADB and the provincial Environmental Protection Bureau. The environmental management plan has to specify the participating parties and their responsibilities and budget.
(ii) Recommend mitigation measures and an environmental management program for each wastewater treatment component. The environmental issues to be considered will include on-site pretreatment of industrial effluents from larger

factories, and identification of processes that discharge effluent directly without pretreatment.

(iii) Determine costs of the proposed measures, appraise the level of cost against expected environmental benefits, help HPG incorporate mitigating measures into the project design, and prepare contractor specifications for environmental management and monitoring.

(iv) Help HPG consult the public at least twice: once at the early stage of EIA fieldwork, again when the draft EIA report is available, and before loan appraisal by ADB.

(v) Prepare a summary EIA, providing technical descriptions of the representative projects and how they will improve the environment. Discuss major alternatives and how the potential negative impacts or concerns will be mitigated.

D. Poverty and Social Analysis

8. The consultants will review the initial poverty and social assessment conducted during TA preparation, and carry out a detailed poverty and social analysis, including a baseline socioeconomic profile of the population living in the project areas, and undertake social analysis and develop a broad-based participatory strategy.

9. The consultants will accomplish the following tasks:

(i) Prepare socioeconomic and poverty profiles for the project areas to be served by the improved wastewater services. Collect data through statistical records, field surveys,[2] and interviews with key informants (e.g., local government officials, women's federations, business associations, community groups, etc.) and participatory community appraisal techniques.

(ii) Based on the initial poverty and social assessment, conduct poverty and social analysis in accordance with ADB's *Handbook on Poverty and Social Analysis of Projects* and *Handbook for Integrating Poverty Impact in Economic Analysis of Projects*. Assess how the ensuing project will help improve people's living conditions and thus enhance public health, and support sustainable economic growth. Estimate the number of project beneficiaries by area, occupation, gender, and income level (poor,[3] low, medium, and high); the number of adversely affected people by type of impact; and the poverty impact ratio. Conduct affordability analysis identifying vulnerable groups and review any impact and mitigation measures required for them.

(iii) Assess the social impact of the ensuing project including willingness to pay, affordability, income levels and distribution, socioeconomic benefits, and possible negative impacts.

(iv) Review existing arrangements and procedures for involving beneficiaries in project design and implementation, hold workshops with beneficiaries and other key stakeholders, develop a tailored information and health education campaign with provisions for monitoring benefits, prepare programs to promote public awareness and participation, and document past and expected future public consultation programs.

(v) Collect and analyze health data, including incidence of morbidity and mortality rates due to waterborne diseases.

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[2] About 1,000 households are anticipated to be surveyed.

[3] Below the official poverty line.

(vi) Confirm that no minority nationalities will be affected by the ensuing project. If any, prepare an ethnic minorities development plan as set out in ADB's *Indigenous People's Policy* 1998.

(vii) For project monitoring, develop a set of verifiable monitoring performance indicators, including operations, financial, environmental, socioeconomic, and poverty reduction parameters. Specify baseline targets for the socioeconomic and poverty indicators, and sustainable mechanisms for monitoring during and beyond the construction stage. Assess the development impact of the ensuing project, focusing on benefits and beneficiaries. Draw up a project performance monitoring system, following the ADB's project performance monitoring system guidelines.

E. Resettlement

10. The consultants will review and update the resettlement plan and/or plans in accordance with ADB policy and guidelines. The consultants will undertake the following tasks:

(i) Review the domestic resettlement plan for each representative project and prepare modifications as required to comply with ADB's *Handbook on Resettlement*. Conduct resettlement household surveys[4] to ensure adequate understanding of social impacts. The resettlement plan must include a village-level impact assessment of project-affected people, land, assets, and occupations.

(ii) Define categories for impact and eligibility of affected people, for compensation and prepare a matrix of entitlements covering compensation and other assistance for all types of impacts to achieve full replacement for lost assets, income, and livelihoods.

(iii) For seriously affected villages, prepare village economic rehabilitation plans to restore incomes of affected people. Identify specific measures for severely affected poor people or other vulnerable households.

(iv) Help HPG and relevant local government officials initiate and expand consultation with affected communities, local leaders, proponents, and stakeholders who might be opposed to the ensuing project. Prepare a consultation plan for HPG and a format for documenting consultation with affected people. Help HPG prepare a resettlement information booklet[5] and distribute it to all affected villages and households.

(v) Justify that compensation standards are based on replacement value, and that the overall resettlement budget is sufficient to acquire the land and implement the resettlement plan based on the proposed entitlements and rehabilitation plans.

(vi) Review the organization structure and capacity for resettlement implementation and recommended improvements and actions required before the start of land acquisition. Help HPG prepare a detailed resettlement implementation schedule and a plan for internal and external monitoring and evaluation.

F. Financial Analysis

11. The consultants will extend the financia1 analysis presented in the domestic feasibility studies. The purpose is to assess the financial and fiscal sustainability of the ensuing project,

[4] For household surveys, ADB requires 10–20% of affected people and enterprises, including 20% of seriously affected people, to be included.

[5] ADB has sample formats.

and financial viability of the municipal wastewater companies (MWCs). The financial analysis will be undertaken in accordance with ADB's *Guidelines for the Financial Governance and Management of Investment Projects Financed by ADB*.

12. The consultants will undertake the following tasks:

(i) Review current accounting and administrative capabilities, the internal control system, and internal and external auditing procedures, and develop an action plan to rectify gaps and weakness identified.
(ii) Establish financial objectives and targets for each representative project and prepare financing plans and projections, including income statements, balance sheets, cash-flow statements, and other relevant financial statements in normal terms, for operations for the 10-year period after project completion.
(iii) Examine the availability of local counterpart funds and assess the liquidity of the various governments for different levels of borrowing.
(iv) Compute in real terms the financial internal rate of return and the average incremental cost in financial terms for each representative project.
(v) Propose possible commercial cofinancing and private sector involvement in the financing plan.

G. Economic Analysis

13. The economic analysis will include, but not be limited to, sector analysis of the Hai River Plan, which identifies and prioritizes future sector developments; standard least-cost analysis of the ensuing project; and distribution analysis, including poverty impact assessment. The economic analysis will be done in accordance with ADB's *Guidelines on Economic Analysis of Projects*, *Handbook for Integrating Poverty Impact Assessment in the Economic Analysis of Projects*, and *Economic Analysis in 2002*.

14. The consultants will have the following tasks:

(i) Identify all project benefits and costs, comparing with- and without-project situations. Estimate the economic internal rate of return and net present value on the basis of non-incremental and incremental economic benefits and economic costs (including economic capital and O&M costs), in constant economic prices. The economic analysis will include evaluation of the environmental aspects and assessment of poverty reduction benefits envisaged under the ensuing project.
(ii) Review tariff levels and structure in accordance with ADB's *Water Policy* in 2001 for each representative project and assess the necessary increase in tariffs and charges in the short and medium term, taking into account affordability, willingness to pay, and full cost recovery. The increased tariffs should be affordable, encourage water savings, allow sufficient cost recovery, and justify need for subsidies as well as tariffs for the poor.
(iii) Examine alternative cost recovery approaches and quantify the subsidy element, and identify the beneficiaries of the subsidy and the required funding mechanism for the subsidy in accordance with ADB's *Criteria for Subsidies*.
(iv) Undertake a sensitivity analysis to assess the effect of adverse changes in key assumptions that underline the economic analysis, including, but not limited to, project costs, tariff increases, and implementation delays. Express the results as sensitivity indicators and switching values. If the ensuing project is sensitive to the value of a key variable, recommend measures to minimize the risk. Carry out

a quantitative risk analysis in accordance with ADB's *Handbook for Integrating Risk Analysis in the Economic Analysis of Projects*.

15. Similar sector analysis will be conducted for other river basins in Henan. The consultants will focus on the investment program under the long- and medium-term sector development plans, and the justification of the investment program should be based on meeting broad social goals. Analysis of the goals should include a review of the process of establishing them, the role of public participation and input, and public support for the resulting goals. Given the goals, the analysis should then consider how to achieve them at least economic cost. The analysis will cover selection criteria for additional projects, relevant policies, and institutions. The analysis should aim to identify enhancements or improvements to policies and institutions to promote attainment of the goals. Policy analysis should also cover user charges but consider them as a general policy tool, not merely for raising revenue. The consultants will also review and evaluate sources of funds for the investment program, including revenue, user charges, commercial credit, concession credit, and foreign aid.

H. Capacity Building and Training

16. The consultants will review and assess the institutional capacity of the provincial and municipal government departments and/or agencies responsible for wastewater management, including financial management and audit requirements, and monitoring and evaluation systems. The consultants will also review and assess the existing institutional capacity of MWCs responsible for project implementation, and O&M of the project facilities upon completion of the ensuing project. Similar exercise will be repeated for the additional projects in the other river basins.

17. Based on the assessment, the consultants will accomplish the following tasks:

(i) Identify deficiencies and prepare recommendations to strengthen the departments' and/or agencies' institutional and technical capability, encompassing administrative, management, organizational, technical (monitoring and evaluation), and financial aspects; and develop outline terms of reference for a capacity-building and/or institutional-strengthening technical assistance, and internal and external training programs.
(ii) Develop corporate management arrangements and finance procedures for the implementing agencies, particularly the preparation and implementation of improved organizational structure and human resources plan, full financial analysis of each MWC to verify its financial status and ensure its financial health, budgeting and business plan development, management information system, and internal and external training programs.
(iii) Design and prepare a technical assistance program, including training of managers and staff responsible for service delivery, to strengthen their capacity to efficiently implement, operate, and maintain the facilities and techniques to be introduced under the ensuing project; and to ensure sustainability of project benefits.
(iv) Propose most appropriate institutional arrangements and related policy framework for private sector participation in wastewater management.

I. Schedule and Reporting Requirements

18. The consultants will submit (i) an inception report, within 1 month of starting work, including full details on the methodological approaches used in the economic analysis and a

preliminary social analysis; (ii) brief monthly progress reports; (iii) an interim report, within 3 months of starting work; (iv) a draft summary EIA together with the EIA and resettlement plan, within 3 months of starting work; (v) a draft final report, within 5 months of starting work, to be discussed at meeting of the Government, ADB, and consultants; and (vi) the final report, within 2 weeks of the tripartite meeting. All reports will be submitted to ADB in English (three copies) and to the Government and HPG in English and Chinese (three copies). The consultants will present all key findings in the draft final workshop.

19. The consultants will help ADB prepare a draft report and recommendation to the President by preparing relevant sections, appendixes, and supplemental information. The consultants will also help ADB and HPG develop a project framework in accordance with ADB guidelines.