ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 46078
October 2013

Proposed Loan and Administration of Technical Assistance Grant
People's Republic of China: Anhui Huainan Urban Water Systems Integrated Rehabilitation Project

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 October 2013)

Currency unit	–	yuan (CNY)
CNY1.00	=	$0.1634
$1.00	=	CNY6.1202

ABBREVIATIONS

ADB	–	Asian Development Bank
CSS	–	combined sewer system
HCWC	–	Huainan Capital Water Company
HMG	–	Huainan municipal government
km	–	kilometer
m^3	–	cubic meter
PMO	–	project management office
PRC	–	People's Republic of China
SSS	–	sanitary sewer system
TA	–	technical assistance
WWTP	–	wastewater treatment plant

NOTE

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

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CONTENTS

PROJECT AT A GLANCE

1. Project Name: Anhui Huainan Urban Water Systems Integrated Rehabilitation Project

2. Project Number: 46078-012

3. Country: People's Republic of China

4. Department/ Division: East Asia Department/Environment, Natural Resources, and Agriculture Division

5. Sector Classification:

Sector	Primary	Subsector
Agriculture and natural resources	√	Water-based natural resources management
Agriculture and natural resources		Irrigation, drainage, and flood protection
Water supply and other municipal infrastructure and services		Water supply and sanitation

6. Thematic Classification:

Themes	Primary	Subthemes
Environmental sustainability	√	Urban environmental improvement, natural resources conservation
Economic growth		Promoting economic efficiency and enabling business environment

6a. Climate Change Impact

Adaptation	Medium
Mitigation	Low

Flood control facilities constructed or improved under the project will be adequate to accommodate the increased precipitation forecasted based on global climate model scenarios.

6b. Gender Mainstreaming

Effective gender mainstreaming (EGM)	√
Gender equity theme (GEN)	
Some gender benefits (SGB)	
No gender elements (NGE)	

7. Targeting Classification:

General Intervention	Targeted Intervention		
	Geographic Dimensions of Inclusive Growth	Millennium Development Goals	Income Poverty at House-hold Level
		√ (MDG7)	

8. Location Impact:

National	Low
Rural	Low
Urban	High

9. Project Risk Categorization: Complex

10. Safeguards Categorization:

Environment	A
Involuntary resettlement	A
Indigenous peoples	C

11. ADB Financing:

Sovereign/ Nonsovereign	Modality	Source	Amount ($ million)
Sovereign	Project loan	Ordinary capital resources	150.00
Total			**150.00**

12. Cofinancing:

Source	Category	Amount ($ million)	Administration Type
Multi-Donor Trust Fund under the Water Financing Partnership Facility	Official-Grant	0.5	Full

13. Counterpart Financing:

Source	Amount ($ Million)
Government	193.30
Total	**193.30**

14. Aid Effectiveness:

Parallel project implementation unit	No
Program-based approach	No

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People's Republic of China (PRC) for the Anhui Huainan Urban Water Systems Integrated Rehabilitation Project. The report also describes proposed administration of technical assistance (TA) to be provided by the Multi-Donor Trust Fund[1] under the Water Financing Partnership Facility for Strengthening Urban Flood Management in Huainan Municipality, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, approve the TA.[2]

2. The project is located in Huainan Municipality of Anhui Province. The project will support the Huainan municipal government (HMG) in implementing components of the Huainan Municipality Master Plan, 2010–2020 related to urban water systems.[3]

II. THE PROJECT

A. Rationale

3. Huainan spans both banks of Huai River; 87 kilometers (km) of the river flow through the municipality. The total land area of the municipality is 1,895.4 square kilometers, and the total population is 2.46 million. Inadequate infrastructure development, rapid urbanization, and economic development have resulted in a heavy pollution load—mainly caused by domestic wastewater and solid waste—to the urban water system, including six urban water channels and five lakes.[4] At the same time, flood control capacity of the urban water systems is not sufficient; various locations in Huainan experience flood damage every year.

4. In the urban area of Huainan, two wastewater treatment plants (WWTPs) serve each of the eastern and western areas of the municipality.[5] Huainan Capital Water Company (HCWC) operates the WWTPs based on a 2004 concession agreement with the HMG. During 2000−2011, Huainan increased the sewer system length from 430 km to 679 km. Each of the two WWTPs has a treatment capacity of 100,000 cubic meters per day (m^3/day). However, the eastern WWTP is treating only 90,000 m^3/day of wastewater and the western WWTP 73,000 m^3/day because the wastewater collection system coverage is still low—64% for the eastern urban area, and 66% for the western urban area. In addition, wastewater generated in Huainan has been increasing from 160,000 m^3/day in 2009 to 228,000 m^3/day in 2011. As a result, the wastewater treatment rate has remained at approximately 75%.

5. Huainan's urban area is served partially by a combined sewer system (CSS) and partially by a sanitary sewer system (SSS). Under the CSS, only a portion of the wastewater collected through combined sewers, together with storm water during floods, is transferred through urban water channels to the eastern or western WWTPs. Most of the wastewater is directly discharged to the lakes and Huai River without treatment. Under the SSS, wastewater collected through sanitary sewers is directly transferred to the WWTPs. Water quality in all six water channels in the urban area are class V+ because they are used to convey both wastewater and storm water. Of the five lakes in the urban area, water quality in Long Lake,

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[1] Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland.
[2] The design and monitoring framework is in Appendix 1.
[3] The Asian Development Bank (ADB) provided project preparatory TA. ADB. 2012. *Technical Assistance to the People's Republic of China for Preparing the Anhui Huainan Urban Water Systems Integrated Rehabilitation Project*. Manila.
[4] Untreated industrial wastewater is not being discharged into the urban water channels, lakes, or Huai River.
[5] The urban area is the same as the project area.

Dajiangou Wetlands, and Shijian Lake are worse than class IV; and water quality in Gaotang Lake is class IV.[6] Sludge, sediment, and solid waste have accumulated in the channels and lakes over time causing increasing deterioration of the urban water and lake environments. While many of the monitoring points of the Huainan section of Huai River are class III, some points are worse than class III at times.[7]

6. Huainan has two types of flooding: (i) overflows from Gaotang Lake and Huai River, and (ii) urban waterlogging.[8] Historically, Huainan has been highly vulnerable to flooding from Huai River. Various flood control projects are being implemented to control floods, and the Huainan section of Huai River will have flood control capacity for a 1 in 100 year flood by 2015. Huainan is also vulnerable to flooding from Gaotang Lake, which occurs once every 3–4 years, inundating areas as extensive as 10 square kilometers. About 22,000 people currently live along the shores of Gaotang Lake. The HMG will develop a new district in this area for an additional 20,000 people in 2020 and 280,000 in 2030. For most of the urban area in Huainan, storm-water runoff flows through the urban water channels and lakes to Huai River. Pump stations discharge storm water from lakes to Huai River. Currently, many of the urban water channels are designed for 1 in 5 year floods. However, the reduced capacity of the urban water channels due to siltation and garbage accumulation, as well as insufficient capacity of the pump stations, still causes waterlogging almost every year.

7. To facilitate the development of Huainan, the HMG prepared the Huainan Municipality Master Plan, 2010–2020, which was approved by the provincial and central governments. The master plan sets targets for 2020 for the water environment (water quality in the urban water systems improved to class IV or above) and flood management (storm-water management system designed to handle 1 in 20 year rain storms).[9] The HMG therefore requested the Asian Development Bank (ADB) to provide lending support to implement and complement components of the master plan related to urban water systems.

8. The PRC's Twelfth Five-Year Plan (2011–2015) supports the long-term goal of building a *xiaokang* (harmonious and moderately prosperous) society through livelihood improvement, and regionally balanced and environmentally sustainable growth.[10] ADB's country partnership strategy, 2011–2015 for the PRC supports the government's overarching strategic goal of building a *xiaokang* society by focusing on three strategic pillars: inclusive growth, environmentally sustainable growth, and regional cooperation and integration.[11] The project is fully consistent with the PRC's Twelfth Five-Year Plan (footnote 10) and ADB's country partnership strategy (footnote 11) by improving the urban water environment, public health, and quality of life. ADB will closely follow the PRC government's new development plan, including

[6] Currently, Caoling Lake is filled with fly ash by private companies; and is basically dried up.

[7] Class I water has the highest quality and class V+ water the worst. Class III water is suitable as a supply source for municipal drinking water treatment and for swimming; class IV is suitable for use as a general industrial water supply and for recreational use involving no direct human contact with the water; class V is suitable only for agricultural water supply and general landscaping use; and class V+ is unsuitable for any use (PRC Environmental Water Quality Standard GB 3838-2002).

[8] Waterlogging occurs in low-lying areas when storm-water runoff exceeds the capacity of the drainage system.

[9] Main components of the master plan are structural measures; nonstructural measures for water environmental improvement and flood management are not included in the master plan.

[10] Government of the People's Republic of China, National People's Congress. 2011. *Outline of the Twelfth Five-Year Plan of the People's Republic of China, 2011–2015.* Beijing.

[11] ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015.* Manila.

the urbanization program;[12] and ensure that the project meets the goals of the government's urbanization strategies.

9. ADB has been supporting projects on wastewater treatment, urban development, and flood and water resources management in the PRC and other countries. Major lessons incorporated in the project design are the importance of (i) nonstructural measures and community participation for environmental improvement and flood management, and (ii) continuous operation and maintenance with sustainable financial sources based on a realistic and enforceable tariff structure. Other general lessons reflected in the project design are (i) sludge management; (ii) effective cross-sector coordination; (iii) capacity development of the executing, implementing, and relevant agencies; and (iv) establishment of an effective project monitoring and evaluation system.

B. Impact and Outcome

10. The impact of the project will be an improved urban water environment, public health, and quality of life for urban residents in Huainan. The outcome will be improved management of surface water resources in Huainan.

C. Outputs

11. The project will have the following outputs:[13]

12. **Output 1: Improvement of wastewater collection.** Output 1 will convert the existing CSS to SSS, and establish SSS in newly developed areas by installing new sanitary sewers. The SSS will separate wastewater and storm water, and transfer the wastewater directly to existing eastern and western WWTPs. Existing buildings and communities being served by CSS will be disconnected from combined sewers and reconnected to the newly installed sanitary sewers.[14] Along and in the urban water channels, intercepting sewers and wells will be installed to transfer wastewater through the SSS to the WWTPs. Under output 1, (i) approximately 192 km of new sewers will be installed, including sanitary sewers, intercepting sewers, and pipes connecting communities to the sanitary sewers;[15] (ii) 10 intercepting wells will be constructed in six urban water channels; and (iii) three wastewater pump stations will be constructed.[16]

[12] The official guidelines for the new government development plan, including an urbanization program, are expected to be disclosed in 2013.

[13] Output 1 will improve water quality in urban water channels and lakes by reducing wastewater inflow into them. Outputs 2 and 3 will improve water quality and environment in and around the channels and lakes by removing sludge, sediment, and solid waste; reducing garbage dumping; constructing wetlands, building revetments, and planting vegetation in and along the lakes; and monitoring water quality and ecological impacts. The channels improved and pump stations constructed or improved under output 2 will transmit storm water from the urban area to Gaotang Lake and Huai River, and reduce flood frequency from 1 in 5 years to 1 in 20 years.

[14] After the conversion of CSS to SSS, combined sewers used for CSS will remain in operation; but only for transfer of storm water to urban water channels.

[15] For buildings and communities where property owners or developers having legal title can be identified, pipes connecting the buildings and communities to the sanitary sewers will be installed by the property owners or developers in accordance with the Urban Wastewater Discharge Permit Management Method issued by the Ministry of Construction (Order No. 152). For the other communities, pipes connecting the communities to the sanitary sewers will be installed under the project and financed under the ADB loan.

[16] Pursuant to the *Agreement on the Expansion of Urban Wastewater Treatment Plant* and its amendment made between HCWC and the HMG, acting through the Huainan Municipal Urban and Rural Construction Committee, in 2012 and 2013, HCWC will expand the eastern WWTP from 100,000 m^3/day to 150,000 m^3/day by June 2015, and to 200,000 m^3/day by 2019; and the western WWTP from 100,000 m^3/day to 150,000 m^3/day by 2018. These expansions are out of the project scope, but the WWTPs are associated facilities of the project.

13. **Output 2: Improvement of urban water channels and flood management.**[17] Output 2 will rehabilitate or construct 5−9 km of six urban water channels to improve the urban water environment and improve urban flood control to meet 1 in 20 year storm water by (i) removing sludge, sediment, and solid waste from the existing channels; and (ii) reconstructing or constructing the waterways, slopes, and embankments.[18] About 10 maintenance stations will be constructed along the channels to store maintenance equipment and provide workstations for maintenance staff. To protect the project area from 1 in 20 year storm water, the flood control capacity of the existing three pump stations will be increased and four new pump stations constructed along Gaotang Lake. To protect the area along Gaotang Lake from 1 in 50 year flood from the lake, about 14.5 km of embankment will be constructed.

14. To improve urban flood management in Huainan, an urban flood forecasting and warning system will be procured. An associated TA will prepare an urban flood and waterlogging management master plan, including arrangements of the flood forecasting and warning system; and develop the capacity of HMG staff for flood management, particularly for flood forecasting and warning. To maintain the urban water channels and improve flood management in Huainan, (i) sampling and monitoring equipment for the urban water channels will be procured; and (ii) consultants will be engaged to (a) pilot community environmental supervision and flood management teams; (b) prepare a water quality and ecological monitoring plan for the urban water channels, and develop the capacity of HMG staff for monitoring; and (c) prepare an urban water channel maintenance program, and develop the capacity of HMG staff for maintenance. Each team will comprise three community members, including at least a female member. A total of eight community environmental supervision and flood management teams will be established in model communities that are seriously affected by pollution and floods from the urban water channels. The teams will (i) raise the environmental awareness of community residents to eliminate waste dumping into the urban water channels; and (ii) disseminate the flood warning system to community residents.

15. **Output 3: Improvement of urban lakes.** To improve water quality and reduce pollution load, artificial wetlands will be constructed at major discharge points into the five lakes. Revetment will be constructed for Dajiangou Wetlands, Long Lake, and Shijian Lake to prevent soil erosion and capture nonpoint source pollution from around the lakes. At Gaotang Lake, revegetation will be piloted in the area between the embankment constructed under output 2 and the lake. The northern pond area of Long Lake will be dredged to remove sludge and sediment, including pollutants; and increase the storage capacity of the pond (footnote 18).

16. To sustain urban lake management, (i) sampling and monitoring equipment will be procured to monitor the lake water quality; and (ii) the consultants engaged under output 2 will (a) design the wetlands, select native plant species for the wetlands, and guide the management of artificial wetlands; (b) assist in piloting a revegetation scheme at Gaotang Lake, and develop HMG staff capacity for revegetation around Gaotang Lake after the project; (c) prepare lake zoning plans for Caoling Lake, Dajianguo Wetlands, and Long Lake to safeguard the natural and biodiversity values of the lakes; and (d) prepare integrated lake management plans for Gaotang Lake and Shijian Lake.

[17] For this project, “flood” includes waterlogging.
[18] Disposal of the dredged sludge and sediment was assessed as part of the environmental impact assessment (accessible from the list of linked documents in Appendix 2).

17. **Output 4: Project management and capacity development.** A project management office (PMO) and implementing agencies will (i) monitor and evaluate project impact, outcome, and outputs using the project performance management system prepared during project preparation; (ii) report project progress and key findings of monitoring through quarterly project progress reports to ADB; and (iii) submit a project completion report within 6 months after project physical completion. The project will provide the HMG and implementing agencies with project management consultants and office equipment. During project implementation, various training sessions, workshops, and domestic and international study tours will be conducted. The project management consultants will assist the PMO in conducting these capacity development activities.

18. **Special features.** The project includes innovative structural measures such as construction of artificial wetlands in the lakes to remove pollutants. The project complements the structural measures with various nonstructural measures, including strengthening HMG capacity for flood management, wastewater collection and treatment planning, and maintenance of the improved urban water channels. The introduction of such international best practices for urban water channel and lake pollution control and management, and flood management is ADB's value addition. In addition, extensive environmental due diligence included an assessment of potential climate change impacts and sensitivity analysis of the capacity of flood control structures[19] based on climate change modeling.[20] As a result, climate change adaptation measures are included in the project and TA for strengthening urban flood management in Huainan (para. 23).[21] The use of sensitivity analysis to examine potential climate change impacts and risks of flood control structures is a replicable best practice that the PRC government can apply to future projects.

D. Investment and Financing Plans

19. The project is estimated to cost $343.33 million (Table 1).

20. The government has requested a loan of $150 million,[22] including taxes and duties,[23] from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years; annuity repayment method with 10% discount factor; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan); and such other terms and conditions set forth in the draft loan and project agreements. Based on these, the average loan maturity is 18.31 years; and the maturity premium payable to ADB is 0.20% per annum.

21. The financing plan is in Table 2. The ADB loan will finance 43.7% of the project cost (base cost, including taxes and duties). The HMG will finance 56.3% (base cost, including taxes and duties; costs for land acquisition, resettlement, and environmental protection; and physical

[19] Climate Change Impact (accessible from the list of linked documents in Appendix 2).

[20] Xiaotao Cheng, Jing Wang, et al. 2008. *Impacts of Climate Change on Flood Management and Drainage Improvement Project and Adaptation Options: A Case Study in the Huai River Basin*. Beijing: China Institute of Water Resources and Hydropower Research.

[21] Recommendations for reducing climate change risks included in the project and TA are (i) incorporate water-sensitive urban design and sustainable urban drainage systems, (ii) select vegetation that is highly tolerant of climate variation, and (iii) increase awareness of climate change impacts and potential adaptation measures.

[22] Includes funds for services (such as transportation and insurance) related to goods (equipment and materials) that are material and relevant to project success.

[23] The calculation of taxes and duties to be financed under the project is based on the following principles: (i) the amount of taxes and duties financed by the ADB loan should not represent an excessive share of the project investment plan, (ii) the taxes and duties should apply only to ADB-financed expenditures, and (iii) the financing of taxes and duties should be material and relevant to project success.

and price contingencies). The PRC will be the borrower of the loan and will make the entire proceeds available to the Anhui provincial government, and then to the HMG. The loan proceeds made available to the Anhui provincial government and the HMG will carry the same terms and conditions as those of the ADB loan. The HMG will assume the foreign exchange and interest rate variation risks on the ADB loan.

Table 1: Project Investment Plan
($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
	1. Improvement of wastewater collection	65.36
	2. Improvement of urban water channels and flood management	201.50
	3. Improvement of urban lakes	19.26
	4. Project management and capacity development	2.28
	Subtotal (A)	**288.40**
B.	**Contingencies**[c]	**48.21**
C.	**Financing Charges During Implementation**[d]	**6.73**
	Total (A+B+C)	**343.33**

Note: Numbers may not sum precisely because of rounding.
[a] Includes taxes and duties of $15.40 million to be financed from the Asian Development Bank (ADB) loan and the government's own resources.
[b] In March 2013 prices.
[c] Physical contingencies were computed at 8.0% of base costs. Price contingencies were computed at an average of 1.9% on foreign exchange costs, and an average of 3.1% on local currency costs; and include provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[d] Includes interest and commitment charges. Interest during construction for the ADB loan was computed at the 5-year forward London interbank offered rate plus a spread of 0.4% and maturity premium of 0.2%. Commitment charges for the ADB loan were computed at 0.15% per year to be charged on the undisbursed loan amount.
Source: Asian Development Bank estimates.

Table 2: Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank	150.00	43.69
Huainan municipal government	193.33	56.31
Total	**343.33**	**100.00**

Source: Asian Development Bank estimates.

E. Implementation Arrangements

22. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.[24]

Table 3: Implementation Arrangements

Aspects	Arrangements
Implementation period	December 2013–September 2019
Estimated completion date	30 September 2019 (project completion date); 31 March 2020 (loan closing date)
Management	
(i) Oversight body	Leading group Executive vice mayor of the HMG (chair) Vice mayor and deputy secretary-general of the HMG; and senior officials of relevant agencies of the HMG, including the Huainan Municipal Development and Reform Commission; Huainan Municipal Finance Bureau; Huainan Municipal Environmental Protection Bureau; Huainan Municipal Urban and Rural Construction Committee; and Huainan Municipal Water Resources Bureau (members)

[24] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Aspects	Arrangements		
(ii) Executing agency	HMG		
(iii) Key implementing agencies	Huainan Municipal Sewage Company, Huainan Municipal Administrative Management Bureau, and Huainan Municipal Landscaping Management Bureau (under the jurisdiction of the Huainan Municipal Urban and Rural Construction Committee)		
(iv) Implementation unit	Project management office established in the HMG, 20 staff		
Procurement	International competitive bidding	16 contracts	$187.49 million
	National competitive bidding	9 contracts	$23.50 million
	Shopping	2 contracts	$0.10 million
Consulting services	Quality- and cost-based selection	17.0 person-months (international); 41.5 person-months (national)	$0.90 million
	Quality- and cost-based selection	7.0 person-months (international); 26.5 person-months (national)	$0.50 million
	Consultants' qualifications selection	32.0 person-months (national)	$0.14 million
Retroactive financing and/or advance contracting	The HMG has requested advance contracting and retroactive financing to enable early start of consultant services and training, and advance contracting to enable early start of procurement of works and goods. Retroactive financing of up to $30.0 million, 20% of the ADB loan, is possible for expenditures before loan effectiveness but not more than 12 months before the signing of the loan agreement.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed by the PRC government and ADB.		

ADB = Asian Development Bank, HMG = Huainan municipal government.
Source: ADB.

III. TECHNICAL ASSISTANCE

23. The HMG has requested policy and advisory TA for Strengthening Urban Flood Management in Huainan Municipality. The TA is estimated to cost $625,000, of which $500,000 will be financed on a grant basis by the Multi-Donor Trust Fund[25] under the Water Financing Partnership Facility, and administered by ADB. The HMG will provide counterpart support in the form of office accommodation, domestic transportation, remuneration and per diem for counterpart staff, and other in-kind contributions. The TA will prepare an urban flood and waterlogging management master plan for the municipality and develop a flood forecasting and warning system. The HMG will be the executing agency. The leading group established for the project will provide overall guidance for TA implementation. The PMO established for the project will administer day-to-day TA activities. The TA will be implemented from April 2014 to March 2016. ADB will engage the consultants following its Guidelines on the Use of Consultants (2013, as amended from time to time). International (13.5 person-months) and national (14.5 person-months) consultants will be recruited through quality- and cost-based selection at a quality–cost weighting ratio of 80:20.

IV. DUE DILIGENCE

A. Economic and Financial

24. The economic analysis indicates that the project is economically viable, with an overall economic internal rate of return of 15.8% and an economic net present value of CNY458.8 million. The rates of return for the individual outputs are 13.2% for improved wastewater collection, 16.8% for improved urban water environment and flood management, and 12.2% for improved urban lake environment. Sensitivity analysis shows that the project is generally robust to potential variations in costs and benefits. The project remains economically

[25] Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland.

viable even with a combination of a benefit decline of 10.0% and a capital cost increase of 10.0%. In addition, the actual economic benefits are likely larger than estimated as some significant types of benefits are not quantifiable due to limited data.

25. The financial sustainability assessment for the nonrevenue suboutputs indicates that the HMG has sufficient funds to finance the counterpart contributions, as well as to finance debt service and operation and maintenance costs during operation. Average annual counterpart funding accounts for 1.05% of the projected HMG revenues during implementation. Annual debt service ranges from 0.12% of projected revenues in 2019 to 0.25% in 2024. Annual funds required for facility operation and maintenance averages around 0.27% of projected revenues and 0.56% of projected expenditures during 2019–2024. The financial analysis for output 1 confirms that it is financially feasible, with a financial internal rate of return of 3.55% compared with the weighted average cost of capital of 2.47%; the financial net present value is estimated to be CNY50.92 million. The financial viability is generally robust but is sensitive to revenue declines. While the HMG will provide subsidies to cover expenses when needed, strengthening the financial sustainability of wastewater collection facilities through gradual increases in the wastewater collection tariff to full-cost recovery will be important.

B. Governance

26. An assessment of HMG's procurement capacity, including the PMO, confirms that it, acting through a procurement agency and with the assistance of ADB and the consultants, would have adequate procurement capacity to facilitate full compliance with ADB's Procurement Guidelines (2013, as amended from time to time) and Guidelines on the Use of Consultants (2013, as amended from time to time). Specific policy requirements, capacity development, and other supplementary measures are described in the project administration manual (footnote 24).

27. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and the HMG. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 24).

C. Poverty and Social

28. The project will reduce flood risk and improve the urban water environment for a population of 962,000 (39.2% of the total population of Huainan), including 65,000 poor people. Such improvements could also benefit the water environment, public health, and quality of life for urban residents in Huainan, thus helping to reduce poverty. The project will create 5,000 temporary jobs during implementation and 120 permanent jobs during operation and maintenance.

29. The project was designed as effective gender mainstreaming. Women's focus group discussions found that environmental improvements are anticipated to have a significant gender impact, with reduced time burdens and costs for health care, preparation for floods, and clean-up after floods; and with overall improvement of living conditions and the environment. The gender action plan contains activities to ensure project benefits are accrued by women at least as equally as by men, including (i) women's participation in discussions on detailed designs, price hearings, community activities, training, and project management; (ii) job offerings to women; and (iii) inclusion of gender perspectives in capacity development of HMG staff. [26]

[26] Gender Action Plan (accessible from the list of linked documents in Appendix 2).

D. Safeguards

30. **Involuntary resettlement (category A).** The project will acquire a total of 126 hectares of land; 248 hectares will be occupied temporarily. The project will demolish 17,257 square meters of housing and 780 square meters of small business shops. It will affect 2,075 people, 1,451 of these will lose more than 10% of their productive assets and/or be physically displaced. The HMG, with the assistance of consultants engaged under the project preparatory TA, prepared a resettlement plan in line with ADB's Safeguard Policy Statement (2009) and related laws and regulations of Huainan Municipality, Anhui Province, and the PRC. The HMG has endorsed the resettlement plan and disclosed the relevant information to affected people. The resettlement plan was also disclosed on ADB website. The HMG will fully finance CNY292.1 million of land acquisition and resettlement costs. The ADB loan will finance the costs for semiannual external resettlement monitoring and evaluation. The HMG has experience in conducting land acquisition and resettlement for foreign-funded projects and has the capacity to implement the resettlement plan for this project.

31. **Indigenous peoples (category C).** Indigenous peoples will not be affected or benefit from the project.

32. **Environment (category A).** The environmental impact assessment report prepared for the project is based on the domestic environmental impact assessment report,[27] as well as the consultant's report on the project preparatory TA; and complies with the PRC's environmental policy and ADB's Safeguard Policy Statement. It concludes that the project will have substantial positive environmental and socioeconomic benefits resulting from (i) improved urban water channels, lakes, and Huai River; (ii) improved management of water and ecology in the lakes; and (iii) improved flood management. Environmental concerns of the project include construction impacts on air, noise, and water quality; solid waste; and disturbance to some water birds. These will be prevented or minimized to acceptable levels through the implementation of an environmental management plan with adequate mitigation and monitoring arrangements. The plan includes a detailed training program to ensure the HMG has adequate capacity to manage and monitor environmental impacts and risks. The environmental impact assessment report was disclosed on ADB website on 28 May 2013.

33. **Grievance redress mechanism.** The PMO will set up a grievance redress mechanism to address social and environmental concerns of stakeholders. The procedures are described in the project administration manual (footnote 24).

E. Risks and Mitigating Measures

34. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[28]

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
The WWTPs existing in the project area do not have adequate capacity to treat an increased volume of wastewater.	Pursuant to an agreement and its amendment made between HCWC and the HMG, acting through the Huainan Municipal Urban and Rural Construction Committee, in 2012 and 2013 HCWC will increase the capacity of the eastern WWTP from 100,000 m^3/day to 150,000 m^3/day by June 2015 and to 200,000 m^3/day by 2019, and the western WWTP from 100,000 m^3/day to 150,000 m^3/day by 2018.

[27] An accredited local environmental research institute prepared a domestic environmental impact assessment report in line with related laws, regulations, and standards of the PRC.
[28] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigating Measures
Buildings and communities are not reconnected from the existing combined sewers to the new sanitary sewers installed under the project.	For buildings and communities where property owners or developers having legal title can be identified, pipes connecting the buildings and communities to the sanitary sewers will be installed by the property owners or developers in accordance with a regulation issued by the Ministry of Construction. For the other communities, pipes connecting communities to the sanitary sewers will be installed under the project and financed by ADB.
The urban water channels improved under the project deteriorate due to garbage dumping into the channels.	Box culverts will be used for sections of the channels where buildings are densely located. An urban water channel maintenance program will be prepared, relevant HMG staff capacity for maintenance will be developed, and community environmental supervision and flood management teams will be established to eliminate garbage dumping into the channels by increasing the environmental awareness of community residents. The HMG will ensure garbage is properly collected around the urban water channels and transferred to existing landfills.

ADB = Asian Development Bank, HCWC = Huainan Capital Water Company, HMG = Huainan municipal government, m^3/day = cubic meter per day, WWTP = wastewater treatment plant.
Source: ADB.

V. ASSURANCES

35. The government and the HMG have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and loan documents.

36. The government and the HMG have agreed with ADB on certain covenants for the project, which are set forth in the loan and project agreements.

VI. RECOMMENDATION

37. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $150,000,000 to the People's Republic of China for the Anhui Huainan Urban Water Systems Integrated Rehabilitation Project, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

1 October 2013

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Improved urban water environment, public health, and quality of life for urban residents in Huainan	Overall public satisfaction with the urban water environment[a] in Huainan increased from 16% in 2012 to 50% by 2025 Health care cost per household decreased from CNY2,100/year in 2012 to CNY1,500/year in 2025 Overall public satisfaction with quality of life in Huainan increased from 63% in 2012 to 80% by 2025	Municipal reports, records, and statistics Periodic household surveys conducted by the PMO	**Assumption** The HMG maintains its commitment to improve the urban water environment, public health, and quality of life. **Risks** Other factors, such as climate change, major outbreak of epidemics, and unexpected recession, adversely affect urban water environment, public health, and quality of life. Urban growth, including influx of migrants in Huainan, exceeds forecasts; and exerts more pressure on available urban infrastructure.
Outcome Improved management of surface water resources in Huainan	From 2012 to 2020, wastewater treatment rates increased from 64% to 75% in the eastern urban area, and from 66% to 80% in the western urban area Wastewater discharge into the urban water channels reduced from 26.0 million m^3/year in 2012 to 8.9 million m^3/year in 2020 Land protected against 1 in 20-year storm water increased to 3,200 hectares by 2020 from 0 in 2012 Water quality of urban water channels and lakes that are worse than class IV in 2012 improved to class IV or above by 2020	Municipal reports, records, and statistics Municipal environmental protection bureau's water quality monitoring reports	**Assumptions** HCWC expands the eastern and western WWTPs based on the agreement with the Huainan Municipal Urban and Rural Construction Committee. Property owners or developers connect their buildings or communities to sewers installed under the project in accordance with the Urban Wastewater Discharge Permit Management Method issued by the Ministry of Construction (Order No. 152). Drains transmit storm water to the urban water channels. The HMG properly operates and maintains the facilities constructed or improved under the project. The CESFMTs are active in the eight communities and established in other communities. Solid waste is properly collected around the urban water channels and lakes, and treated at existing waste treatment plants. The HMG implements the urban flood and waterlogging management master plan and the water quality and ecological monitoring plan.
Outputs 1. Improvement of wastewater collection	3,200 households connected to new sanitary sewers by 2020 5,700 households reconnected from existing combined sewers to new sanitary sewers by 2020	Municipal reports, records, and statistics ADB mission reports Quarterly project progress reports	**Assumptions** Adequate counterpart funds are made available on time. The HMG maintains dedicated PMO staff at required levels and qualifications.

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	30% of employment opportunities (450 jobs) created during construction and operations directed to women	External resettlement M&E reports Semiannual internal environmental monitoring reports Project completion report	Necessary information is available on time. All geographic sites are accessible without any government restrictions. The HMG accepts and adopts urban flood and waterlogging management master plan, urban water channels maintenance program, water quality and ecological monitoring plan, lake zoning plans, and integrated Shijian Lake management plan prepared under the project or the associated TA. The Anhui provincial government and the three other municipalities surrounding Gaotang Lake support and facilitate preparation of an integrated Gaotang Lake management plan. **Risks** Unexpected technical difficulties are experienced during project implementation. The PMO has limited experience in administering ADB-financed projects. Project implementation, including the engagement of a procurement agency and project management support consultants, is delayed by external factors.
2. Improvement of urban water channels and flood management	The six urban channels with capacity for 1 in 20-year storm water and without sludge, sediment, and solid waste operating by 2017 Seven pump stations with capacity for 1 in 20-year storm water operating by 2018 New 14.5 km embankment along Gaotang Lake for 1 in 50-year flood operating by 2018 Urban flood and waterlogging management master plan approved by the HMG by 2016 Flood forecasting and warning system established by 2015 CESFMTs (at least one female member in each) operating in eight communities by 2017 Urban water channel maintenance and water quality and ecological monitoring regularly conducted from 2017 30% of employment opportunities (810 jobs) created during construction and operation directed to women		
3. Improvement of urban lakes	Five lakes protected from pollution by artificial wetlands, revetments, and revegetation by 2017 Water quality and ecological monitoring regularly conducted from 2017 Three lake zoning plans and two integrated lake management plans established by 2017 and implemented from 2018		
4. Project management and capacity development	Quarterly project progress reports submitted by the PMO to ADB during 2014−2020 External resettlement M&E reports submitted to ADB, by an independent agency for external resettlement M&E through the PMO, during 2014−2017 PMO submits acceptable (to ADB) semiannual internal environmental monitoring reports to ADB during 2014–2018		

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	8,000 people, including HMG staff and residents, trained for project management, O&M of constructed or improved facilities, and health awareness and knowledge by 2019 The PMO submits project completion report to ADB in 2020		

Activities with Milestones

1. Improvement of wastewater collection
1.1 Install 191.8-km sewer by 2017
1.2 Construct three wastewater pump stations by 2017

2. Improvement of urban water channels and flood management
2.1 Increase the flood control capacity of three storm-water pump stations by 2015, and construct four storm-water pump stations along Gaotang Lake by 2018
2.2 Procure equipment for flood forecasting and warning, and water quality and ecological monitoring by 2015
2.3 Prepare urban flood and waterlogging management master plan, and conduct capacity development for flood forecasting and warning by 2015
2.4 Reconstruct or construct six urban water channels by 2017
2.5 Pilot CESFMTs by 2017
2.6 Prepare a water quality and ecological monitoring plan for the urban water channels and develop relevant HMG staff capacity for the monitoring by 2017
2.7 Construct 14.5-km Gaotang Lake embankment by 2018

3. Improvement of the urban lakes
3.1 Procure equipment for water quality and ecological monitoring by 2015
3.2 Construct artificial wetlands and revetments, conduct pilot revegetation, and complete dredging by 2017
3.3 Prepare lake zoning plans and integrated lake management plans by 2017

4. Project management and capacity development
4.1 Recruit project management consultants by 2014
4.2 Recruit an independent agency for external resettlement M&E by 2014
4.3 Conduct land acquisition and resettlement by 2015
4.4 Implement the EMP, and submit semiannual environmental monitoring reports to ADB by 2018
4.5 Monitor and evaluate project impact, outcome, and outputs using the project performance management system; submit quarterly project progress reports by 2020
4.6 Submit project completion report by 2020

Inputs

Loan
ADB: $150.00 million

Item	Amount ($ million)
Civil works	119.20
Equipment	21.92
Consultants	1.54
Training, study tours, conferences, and workshops	0.60
Financial charges during implementation	6.73

HMG: $193.33 million

Item	Amount ($ million)
Civil works	69.95
Land acquisition and resettlement	44.18
Social and environmental monitoring	0.74
Survey, design, and supervision	30.21
Consultants	0.04
Contingencies	48.21

Technical Assistance Grant
Multi-Donor Trust Fund[b] under the Water Financing Partnership Facility: $500,000

Item	Amount ($'000)
Consultants	453.40
Surveys	16.00
Miscellaneous administration and support cost	6.40
Contingencies	24.20

Note: The HMG will provide counterpart support in the form of office accommodation; domestic transportation, remuneration, and per diem; and other in-kind contributions.

ADB = Asian Development Bank, CESFMT = community environmental supervision and flood management team, EMP = environmental management plan, HCWC = Huainan Capital Water Company, HMG = Huainan municipal government, km = kilometer, M&E = monitoring and evaluation, m^3 = cubic meter, O&M = operation and maintenance, PMO = project management office, TA = technical assistance, WWTP = wastewater treatment plant.
Note: Numbers may not sum precisely because of rounding.
[a] Urban water environment is environment in and around the urban water channels and lakes improved under the project including water quality, odor, vegetation, and flora and fauna.
[b] Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland. Administered by ADB.
Source: ADB estimates.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=46078-002-3

1. Loan Agreement
2. Project Agreement
3. Sector Assessment (Summary): Agriculture and Natural Resources, and Water Supply and Other Municipal infrastructure and Services
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Gender Action Plan
12. Environmental Impact Assessment
13. Resettlement Plan
14. Risk Assessment and Risk Management Plan

Supplementary Documents

15. Climate Change Impact
16. Procurement Capacity Assessment Report and Recommendations
17. Technical Assistance
18. Current Water Flow Diagram in the Project Area