FINANCIAL ANALYSIS

1. The financial analysis includes (i) financial sustainability analysis; (ii) an assessment of the financial viability of the revenue-generating outputs, i.e., the wastewater collection and transmission system; and (iii) assessment of the financial management capacity of the executing and implementing agencies. All analyses followed the Asian Development Bank (ADB) guidelines on Financial Management and Analysis of Projects and Financial Due Diligence: A Methodology Note.[1]

A. Financial Sustainability Analysis of Non-Revenue-Generating Outputs

2. Financial sustainability analysis was to assess the fiscal sustainability and debt repayment capacity of the Huainan municipal government (HMG) as a whole. The trends of economic growth and total revenues and expenditures (on and off budget and transfers) were analyzed, and HMG's financial performance assessed. The HMG will provide counterpart funding during implementation, and pay debt service, and operation and maintenance (O&M) funds for non-revenue-generating outputs[2] following project completion. The objectives of this assessment are

(i) to review the historical revenue-generating capacity and the share of revenue from higher government sources during 2007–2011, and determine how much expenditure this supports;
(ii) based on historical revenue-generating capacity, assess the financial capacity of the HMG to finance counterpart funding during project implementation; and
(iii) based on projections of financial income, assess the capacity of the HMG to finance O&M and debt service costs, in addition to its other obligations, over the loan payback period.

3. The financial sustainability assessment indicates that the HMG has sufficient funds to finance the counterpart contributions, as well as to finance debt service and O&M costs during operation.[3] Average annual counterpart funding accounts for 1.05% of the HMG's projected revenues during implementation. Annual debt service ranges from 0.12% of projected revenues in 2019 to 0.25% in 2024. Annual funds required for the O&M of facilities averages around 0.27% of projected revenues and 0.56% of projected expenditures during 2019–2024.

B. Financial Analysis of the Revenue-Generating Output

4. The revenue-generating wastewater collection output will involve (i) installing 191.8 kilometers of new sewers, including sanitary sewers, intercepting sewers, and pipes connecting communities to the sanitary sewers; (ii) constructing 10 intercepting wells in six urban water channels; and (iii) constructing three wastewater pump stations. The wastewater treatment plant expansions are not part of this project. The Huainan Capital Water Company has entered into an agreement with the HMG for wastewater treatment plant expansion, which will provide sufficient capacity to treat the additional wastewater collected.

5. Financial analysis of the wastewater collection output assessed its ability to generate sufficient funds to meet O&M, depreciation, and debt service of the wastewater collection

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1 ADB. 2005. *Financial Management and Analysis of Projects*. Manila; and ADB. 2009. *Financial Due Diligence: A Methodology Note.* Manila.
2 The HMG will also be responsible for financing any shortfall in O&M costs and debt service for the revenue-generating component.
3 For debt service, there is no accepted criterion of affordability; but where debt service payments associated with the project exceed 2.5% of the municipal local revenue base or 1.0% of total municipal revenues, the required debt service burden may be a cause for concern.

system. All financial costs and benefits are expressed in March 2013 prices. The costs used to calculate the financial internal rates of return (FIRRs) include capital investment and O&M costs derived from the project feasibility study reports. The following assumptions are used:

(i) All costs are expressed in March 2013 prices.

(ii) Wastewater pipelines are assumed to have an economic life of 20 years after construction; the output is analyzed over 20 years excluding the construction period.

(iii) The foreign exchange rate of CNY6.2 = $1.0 is used when converting foreign exchange costs to local currency equivalent.

(iv) Capital costs include base cost of the output, including physical contingencies, but exclude price contingencies and financial charges during implementation that may result from debt financing.

(v) O&M costs include personnel salaries and welfare; and repair, maintenance, and other costs. Expenses include depreciation of net fixed assets.[4]

(vi) Revenues are derived from transfers from the HMG and from tariffs.

(vii) Household income is assumed to increase in line with the growth of gross domestic product of Huainan.

(viii) Net cash flows from the output are determined after income taxes calculated at 25%.

(ix) In the income statement, escalation in costs over the long term is assumed at 3.0% per annum.

(x) Technical data and costs are obtained from the output feasibility study and technical analysis conducted under the project preparatory technical assistance to form the basis of the financial analysis and the FIRR.

6. Wastewater tariffs used to estimate revenues are those existing in Huainan in 2013, and are assumed to increase gradually until full cost recovery is achieved. The existing water and wastewater tariffs in the project area are typical urban tariffs in the People's Republic of China (PRC), differentiated by customer class. In 2012, the domestic tariff was CNY0.63/cubic meter (m^3), the nondomestic tariff CNY1.00/m^3, and the special tariff CNY2.22/m^3. The wastewater fee is charged on the water bill as 80% of water use, and is collected by the Huainan Capital Water Company and then transferred to the Huainan Municipal Finance Bureau (HMFB). HMFB allocates part of the revenue from the wastewater tariff to the Huainan Municipal Sewage Company (HMSC), which is responsible for O&M of wastewater collection systems in Huainan.

7. The wastewater tariff has been increased periodically in Huainan following set procedures. It was increased for all customer classes in 2004 and again in 2012 for two customer classes. Tariffs are expected to be increased gradually to full-cost recovery to allow for (i) cost recovery of O&M costs, (ii) debt service, and (iii) depreciation of all assets. This can be achieved by increasing the wastewater tariff by 5% starting in 2019 and every 5 years thereafter. The HMG agrees to ensure that (i) wastewater tariffs will be set to rise progressively to provide sufficient revenue for O&M of the infrastructure; (ii) periodic review of tariffs and fees will be undertaken following specified tariff-setting mechanisms; (iii) the impact of wastewater collection fees and tariffs on the poor will be assessed and, based on the assessment, necessary subsidies will be provided to ensure wastewater collection services to the poor; and (iv) a public tariff consultation hearing will be held to consult with the affected people when setting or adjusting tariffs for wastewater.

8. **Tariff affordability analysis.** The wastewater tariff during the first year of operation (2019) is assumed to be CNY0.63/m^3 for domestic consumers. Tariffs are assumed to increase

[4] Depreciation expense was added back to the cash flows in the calculation of the project output's FIRR.

by 5% every 5 years starting in 2019. Tariffs are considered affordable when they do not exceed 5% of monthly household incomes based on monthly water consumption of 13–17 m^3. The tariff affordability analysis shows that the share of income spent on water and wastewater are well below the benchmark of 5.0% during the project life: about 0.4% for average income households and 1.0% for low-income households.

9. **Investment cost.** The wastewater collection output has an estimated total financial cost of CNY487.94 million. Capital costs include civil works, equipment, land acquisition and resettlement, environmental and social monitoring costs, capacity building, and taxes and duties. It includes physical contingencies, but excludes price contingencies and financing charges during construction as a result of any debt financing.

10. **Weighted average cost of capital.** To compute the weighted average cost of capital (WACC), the financing sources were assumed to comprise the HMG's equity contributions and the ADB foreign currency loan. The loan rate is assumed to be a 10-year fixed swap rate in dollars,[5] plus an ADB margin of 0.4% and a maturity premium of 0.20%, for a total of 2.69% per annum. The cost of equity is calculated at 8%,[6] assuming a risk-free rate of return of 6% plus a 2% margin. Income tax is assumed at 25%, with the WACC calculated on an after-tax basis. The other assumptions are a domestic inflation rate of 3.0% and an international inflation rate of 1.9%. The computed average real WACC for the wastewater collection system output is 2.47% (Table 1).

Table 1: Weighted Average Cost of Capital

Source	**Amount** (CNY million)	**Weighting**	**Nominal Rate**	**Tax**	**Nominal Rate after Tax**	**Inflation Rate**	**Real Term**	**WACC**
ADB	244.86	50%	2.69%	25%	2.01%	1.9%	0.11%	0.06%
HMG	243.08	50%	8.00%	0%	8.00%	3.0%	4.85%	2.42%
Total	**487.94**	**100%**						
Real WACC								**2.47%**

ADB = Asian Development Bank, HMG = Huainan municipal government, WACC = weighted average cost of capital.
Source: ADB estimates.

11. **Financial internal rate of return.** The FIRR for the wastewater collection output is 3.55% compared with the WACC of 2.47% (Table 2). The financial net present value, using a discount rate equal to the WACC, is estimated to be CNY50.92 million. This output is therefore considered to be financially viable.

5 Ten-year fixed swap rate of 2.086% per annum (as of 21 February 2013).

6 Recent ADB projects assume a cost of equity of 8%, including ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Integrated Development of Key Townships in Central Liaoning*. Manila; and ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Anhui Chao Lake Environment Rehabilitation Project*. Manila.

Table 2: Financial Internal Rate of Return
(CNY million)

Year	Capital Cost	O&M	Total Cost	Revenue	Net Cash Flow
2014	43.70	0.00	43.70	0.00	(43.70)
2015	131.09	0.00	131.09	0.00	(131.09)
2016	131.09	0.00	131.09	0.00	(131.09)
2017	87.39	0.00	87.39	0.00	(87.39)
2018	43.70	0.00	43.70	0.00	(43.70)
2019		23.36	23.36	59.62	36.26
2020		24.06	24.06	59.62	35.56
2021		24.78	24.78	59.62	34.84
2022		25.53	25.53	59.62	34.10
2023		26.29	26.29	59.62	33.33
2024		27.08	27.08	62.61	35.52
2025		27.89	27.89	62.61	34.71
2026		28.73	28.73	62.61	33.88
2027		29.59	29.59	62.61	33.01
2028		30.48	30.48	62.61	32.13
2029		31.39	31.39	65.74	34.34
2030		32.34	32.34	65.74	33.40
2031		33.31	33.31	65.74	32.43
2032		34.30	34.30	65.74	31.43
2033		35.33	35.33	65.74	30.40
2034		36.39	36.39	69.02	32.63
2035		37.49	37.49	69.02	31.54
2036		38.61	38.61	69.02	30.41
2037		39.77	39.77	69.02	29.25
2038		40.96	40.96	69.02	28.06
FNPV@WACC 2.47%					**50.92**
FIRR					**3.55%**

( ) = negative, FIRR = financial internal rate of return, FNPV = financial net present value, O&M = operation and maintenance, WACC = weighted average cost of capital.
Source: Asian Development Bank estimates.

12. **Sensitivity analysis.** The financial viability of the outputs is assessed using standard sensitivity analysis, including a 10% increase in capital costs, 10% increase in operating costs, 10% decrease in revenues, simultaneous 10% increase in capital costs and 10% decrease in revenues, and 1-year delay in implementation (Table 3). The financial viability is generally robust, but is sensitive to revenue declines. HMSC receives funds from HMFB to cover its expenses; HMFB will provide subsidies to HMSC when needed. Therefore, the government guarantees the viability of the wastewater collection facilities. Yet, strengthening the financial sustainability of wastewater collection facilities through gradual increases in the wastewater collection tariff to full-cost recovery is important.

Table 3: Sensitivity and Switching Value Analyses

Sensitivity Test	FIRR (%)	FNPV (CNY million) @ WACC = 2.47%	SI	SV (%)
10% increase in capital cost	2.7	10.2	2.5	12.3
10% increase in operating costs	2.7	8.5	2.5	12.1
10% decrease in revenues	1.6	(37.3)	5.4	5.6
10% decrease in revenues and 10% increase in costs	(0.3)	(120.4)	10.7	2.8
One-year delay in implementation	3.3	34.8		

( ) = negative, FIRR = financial internal rate of return, FNPV = financial net present value, SI = sensitivity indicator, SV = switching value, WACC = weighted average cost of capital.
Source: Asian Development Bank estimates.

C. Financial Management Assessment

13. The financial management assessment (FMA) of the executing and implementing agencies includes a review of accounting and financial reporting systems, internal and external auditing arrangements, staffing, fund disbursement procedures, and financial information systems. ADB guidelines (para. 1) for undertaking an FMA involve the following steps: (i) use a standard questionnaire to assess the financial management of the relevant project implementation units; (ii) identify issues for review based on results of the questionnaire; and (iii) identify appropriate financial covenants to monitor financial conditionalities of the project for which the implementing agency would be responsible.

14. The Anhui Provincial Finance Department (APFD) will operate and administer the imprest account. HMFB, on behalf of the HMG as the executing agency, and the three implementing agencies—the Huainan Municipal Administration Management Bureau (HMAMB), the Huainan Municipal Landscaping Management Bureau (HMLMB), and HMSC—will establish subaccounts to receive funds transferred from the imprest account. APFD has extensive experience administering foreign-financed projects, including ADB-financed projects. HMFB, the project management office (PMO), and the implementing agencies—the HMAMB, HMLMB, and HMSC—were assessed. The assessment concludes that (i) HMFB, the PMO, and the implementing agencies strictly follow established PRC financial management policies; (ii) HMFB has strong financial management capacity and extensive experience in administering foreign-financed projects; (iii) HMSC has sound financial management capability and is experienced in managing foreign-funded and locally funded projects; and (iv) HMAMB and HMLMB have experience only in locally financed projects. Training and support will be required on ADB policies and procedures, including disbursement and project management, especially for HMAMB and HMLMB.

15. The FMA recommends capacity development measures to ensure that the implementing agencies are able to meet the project's financial management requirements. It proposes that the implementing agencies strengthen their financial management capability to manage the project outputs, including (i) undertaking training, particularly on ADB policies, procedures, and requirements, by invited experts from ADB's PRC Resident Mission and experienced consultants; (ii) moving staff with experience in handling foreign funds from other agencies within the HMG to the finance section of the implementing agencies; (iii) hiring additional finance staff as needed, and appointing finance staff to manage project accounts; and (iii) seeking external financial management assistance as needed, such as assistance from APFD. HMFB and the PMO have committed to assist the two implementing agencies in strengthening their financial management capacity to manage the project before its implementation.