

ASIAN DEVELOPMENT BANK

PCR: PRC 28207

PROJECT COMPLETION REPORT

ON THE

**ZHEJIANG-SHANXI WATER SUPPLY PROJECT (PHASE I)
(Loan 1544-PRC)**

IN THE

PEOPLE'S REPUBLIC OF CHINA

August 2004

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

		At Appraisal	At Project Completion
		(31 August 1997)	(31 August 2004)
CNY1.00	=	\$0.1203	\$0.1208
\$1.00	=	CNY8.3119	CNY8.2768

ABBREVIATIONS

ADB	–	Asian Development Bank
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
O&M	–	operation and maintenance
RP	–	resettlement plan
PCRM	–	project completion review mission
PMO	–	project management office
PRC	–	People's Republic of China
PSP	–	postrelocation support plan
SEDC	–	Shanxi Economic Development Company
SRP	–	summary resettlement plan
TA	–	technical assistance
WACC	–	weighted average cost of capital
WEPB	–	Wenzhou Electric Power Bureau
WMG	–	Wenzhou Municipal Government
WRO	–	Wenzhou Resettlement Office
ZPG	–	Zhejiang Provincial Government

WEIGHTS AND MEASURES

km	–	kilometer
kWh	–	kilowatt-hour
m	–	meter
m ³	–	cubic meter
MW	–	megawatt

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	People's Republic of China
2.	Loan Number	1544-PRC
3.	Project Title	Zhejiang-Shanxi Water Supply Project (Phase I)
4.	Borrower	People's Republic of China
5.	Executing Agency	Zhejiang provincial government
6.	Amount of Loan	\$100.0 million
7.	Project Completion Report Number	PCR: PRC 849

B. Loan Data

1.	Appraisal	
	– Date Started	29 May 1997
	– Date Completed	7 June 1997
2.	Loan Negotiations	
	– Date Started	20 August 1997
	– Date Completed	22 August 1997
3.	Date of Board Approval	24 September 1997
4.	Date of Loan Agreement	20 July 1998
5.	Date of Loan Effectiveness	
	– In Loan Agreement	20 July 1998
	– Actual	17 February 1999
	– Number of Extensions	2
6.	Closing Date	
	– In Loan Agreement	30 June 2002
	– Actual	10 July 2003
	– Number of Extensions	2
7.	Terms of Loan	
	– Interest Rate	Variable Lending Rate
	– Maturity (number of years)	24.5
	– Grace Period (number of years)	4.5
8.	Terms of Relending (if any)	
	– Interest Rate	Variable Lending Rate
	– Maturity (number of years)	24.5
	– Grace Period (number of years)	4.5

2. Financing Plan (\$million)

Cost	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
Implementation Costs						
Borrower Financed	11.50	401.90	413.40	0.00	364.44	364.44
ADB Financed	83.10	0.00	83.10	30.11	0.00	30.11
Other External Financing	0.00	0.00	0.00	0.00	0.00	0.00
Total	94.60	401.90	496.50	30.11	364.44	394.55
Borrower Financed	0.00	4.60	4.60	0.00	35.85	35.85
ADB Financed	16.90	0.00	16.90	6.86	0.00	6.86
Other External Financing	0.00	0.00	0.00	0.00	0.00	0.00
Total	16.90	4.60	21.50	6.86	35.85	42.71

ADB = Asian Development Bank, IDC = interest during construction.

3. Cost Breakdown by Project Component (\$ million)

Description	Appraisal			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
A. Base Costs						
Civil Works	0.00	141.92	141.92	0.00	162.92	162.92
Metal Structures	6.16	6.24	12.40	3.21	9.08	12.29
Electrical and Mechanical	21.91	14.72	36.63	18.58	28.20	46.78
Transmission Works	2.05	13.82	15.87	0.00	9.26	9.26
Project Management	0.00	8.78	8.78	0.00	1.13	1.13
Survey and Design	0.00	11.62	11.62	0.00	5.40	5.40
Consulting and Training	1.20	2.06	3.26	0.73	1.87	2.60
Resettlement	16.59	100.93	117.52	0.00	137.58	137.58
Environment	0.00	1.54	1.54	0.00	9.00	9.00
Const Equip/Materials	37.23	0.00	37.23	7.59	0.00	7.59
Taxes and Duties	0.00	25.78	25.78	0.00	0.00	0.00
Subtotal	85.14	327.41	412.55	30.11	364.44	394.55
B. Contingencies						
Physical	5.25	30.40	35.65	0.00	0.00	0.00
Price	4.16	44.13	48.29	0.00	0.00	0.00
Subtotal	9.41	74.53	83.94	0.00	0.00	0.00
C. IDC and other charges	16.90	4.57	21.47	6.86	35.85	42.71
Total	111.45	406.51	517.96	36.97	400.29	437.26

IDC = interest during construction.

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	Jul 1996	Jul 1996
Completion of Engineering Designs	Sep 1999	Sep 1999
Civil Works Contract		
Date of Award	Jul 1999	Jul 1997
Completion of Work	Dec 2001	Dec 2001
Equipment and Supplies		
Dates		
First Procurement	Jan 1997	Jan 1997
Last Procurement	Dec 2001	Dec 2001
Completion of Equipment Installation	Dec 2001	Dec 2001
Start of Operations	Jan 2002	Apr 2003

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 31 Dec 1998 to 30 Nov 2000	Satisfactory	Satisfactory
From 31 Dec 2000 to 30 Nov 2001	Satisfactory	Highly Satisfactory
From 31 Dec 2001 to 31 May 2002	Satisfactory	Satisfactory
From 30 Jun 2002 to 30 Jun 2003	Satisfactory	Highly Satisfactory
From 31 Jul 2003 to 29 Feb 2004	Satisfactory	Satisfactory

D. Data on Asian Development Bank Missions

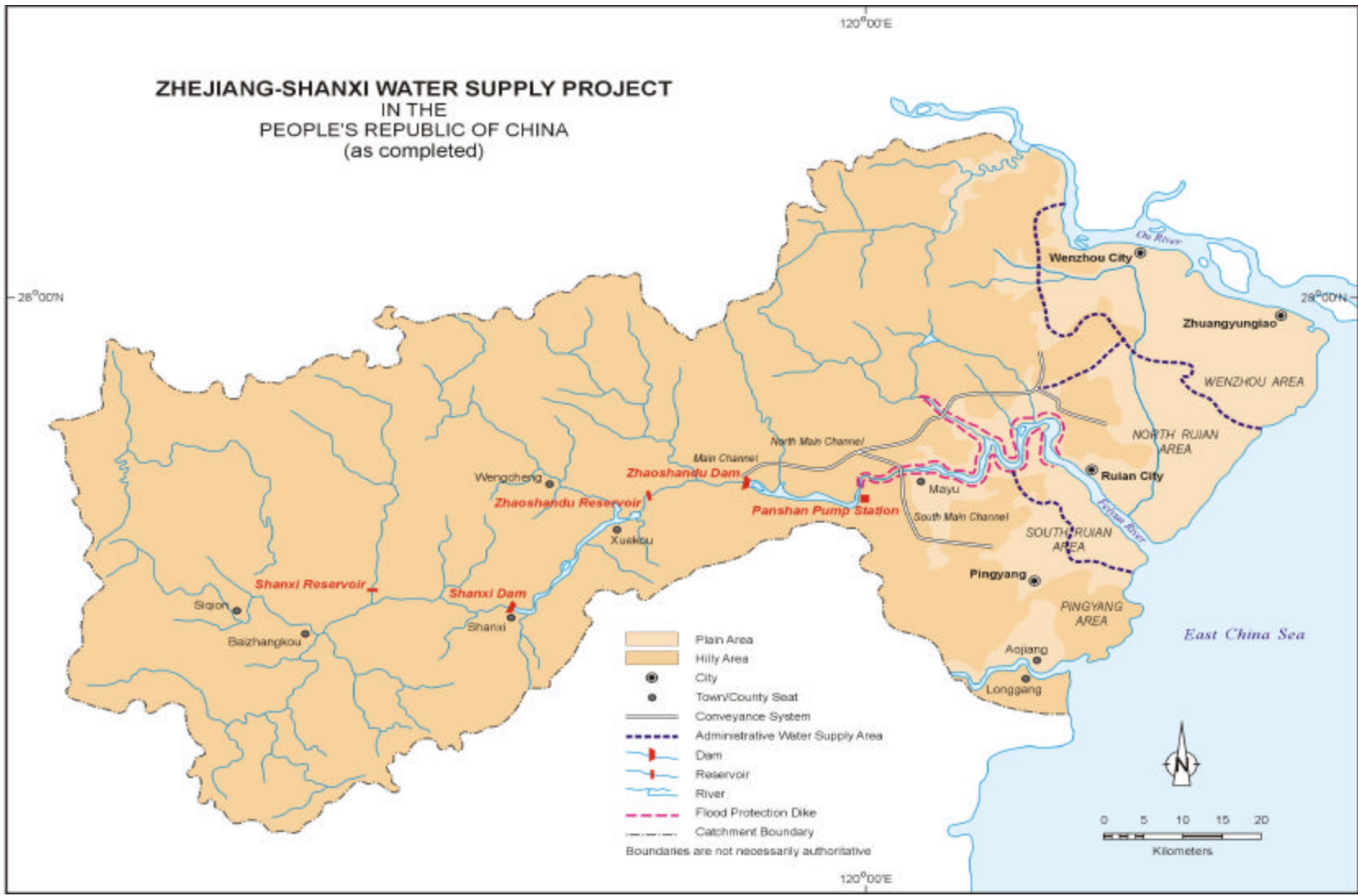
Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Fact-Finding	15–18 Apr 1997	5	20	a, b, c, d, e, f
Appraisal	28 May–7 Jun 1997	4	44	a, b, c, d, e, f
Inception	14–21 Sep 1998	2	16	g, h
Review 1	3–7 Jul 2000	2	10	g, l
Review 2	8–17 Nov 2000	3	30	d, f, g, i
Review 3	18–22 Mar 2001	2	10	j, k
Review 4	3–6 Dec 2002	1	4	l
Review 5	23–26 Feb 2003	2	8	k, l
Project Completion Review ^b	31 May–11 Jun 2004	4	41	d, g, k, l

Note:

^aa – economist, b – environment specialist, c – program officer, d – financial analyst, e – social development specialist, f – senior project engineer, g – assistant project analyst, h – urban development specialist, i – staff consultant, j – project engineer, k – resettlement specialist, l – senior project specialist

^bThe project completion report was prepared by In-Ho Keum, Head, Project Administration Unit, Social Sectors Division, East and Central Asia Department.

ZHEJIANG-SHANXI WATER SUPPLY PROJECT
 IN THE
 PEOPLE'S REPUBLIC OF CHINA
 (as completed)



04/21/12 HP

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I. PROJECT DESCRIPTION

1. The urban sector in the People's Republic of China (PRC) underwent unprecedented growth, especially in the eastern provinces, in the 1980s and 1990s. Industrial production more than doubled every 5 years in many regions and urban populations grew at more than 5% per year. Wenzhou, one of 14 special economic zones, is located on the southeast coast of Zhejiang Province. In the urban areas of Wenzhou Prefecture, increasing demand resulting from rapid urban growth and industrialization outstripped the capacity to supply basic urban services and social infrastructure. This led to deterioration in the quality of urban life and degradation of the urban environment.

2. The shortage of good quality water for the urban areas of Wenzhou Prefecture, including Wenzhou, Ruian, and Pingyang cities, was critical. The demand for water exceeded the capacity of the existing water supply systems to the point that water was available only intermittently in some areas. The physical shortage of water was exacerbated by the fact that raw water sources for these systems, the local canals, were severely polluted because of the discharge of untreated wastewater and agricultural runoff. Raw water was much worse than the standard considered suitable for a municipal water source. This posed a threat to the public health of the 2.2 million urban residents and to the area's economic activities. The most cost-effective way of replacing the existing polluted raw water supply and meeting new demand was by constructing a dam to create the storage needed to ensure year-round supply, concurrently providing several corollary benefits including flood protection, irrigation, and hydroelectric power peaking capacity.

3. Based on the feasibility study carried out under Asian Development Bank (ADB)-funded technical assistance (TA)¹, ADB approved a loan of \$100 million from its ordinary capital resources on 24 September 1997. The loan carried a term of 25 years, including a grace period of 4.5 years, with interest determined in accordance with its pool-based variable lending system for US dollar loans, and an annual commitment fee.

4. The Loan Agreement was signed on 20 July 1998 and the loan was declared effective on 17 February 1999. The loan closing date was extended by 12 months from 30 June 2002 to 30 June 2003. The map gives the location of the project facilities and Appendix 1 provides a chronology of major events related to the Project. The project framework is in Appendix 2.

5. The long-term objective of the Project was to alleviate the water supply crisis in Wenzhou Prefecture. The short-term objectives were to (i) provide up to 1.8 million cubic meters per day (m³/day) of good quality raw water supply to the three main urban areas in Wenzhou Prefecture, (ii) improve flood protection for 250,000 persons in the lower Feiyun River valley, (iii) provide irrigation water for 60,000 hectares, and (iv) provide installed capacity of 220 megawatts (MW) of hydroelectric power on a peaking basis. In addition to the physical objectives, the Project aimed to support improved efficiency and governance of the Shanxi Economic Development Company (SEDC).

6. The Project had the following components: (i) a 130-meter (m) high storage dam at Shanxi town with a 200 MW hydroelectric generating plant, related diversion tunnels, electrical transformer station, and transmission facilities; (ii) a 16 m high diversion dam at Zhaoshandu town with a 20 MW hydroelectric generating plant, related electric transformer station, and

¹ ADB. 1997. *Technical Assistance to the People's Republic of China for the Zhejiang-Shanxi Water Conservancy Project*. Manila.

transmission facilities; (iii) 62.8 kilometer (km) gravity flow water conveyance system including tunnels, structural aqueducts, pipes, and inverted siphons; and (iv) capacity building for SEDC and the responsible Wenzhou municipal government (WMG) bureaus.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

7. Improved water supply and sanitation facilities are needed to sustain economic growth and increasing productivity, to improve living standards of the urban population, and to arrest environmental degradation. Developing efficient systems to treat and distribute raw water, and treat and dispose of wastewater require substantial investments in infrastructure and human resource development. ADB has supported priority projects in water resources development and urban water supply in the PRC since 1993. The three strategic objectives of ADB's operations in the PRC in the 1990s were (i) economic efficiency, (ii) poverty reduction, and (iii) environmental protection and resource management. In the water resources development and urban water supply sector, priority was given to (i) improving the efficiency of water supply and distribution systems through investment in physical infrastructure; (ii) improving cost recovery by strengthening tariff systems and structures for raw and treated water; and (iii) promoting water resources conservation and environmental protection. The Project has supported these objectives by constructing infrastructure; providing water supply systems with reliable, good quality source water; and improving management of water resources in the Feiyun River.

8. Under the Ninth Five-Year Plan (1996–2000), development of the water supply and wastewater treatment infrastructure became a priority area. The Government's strategy focused on (i) developing water sources and protecting existing sources by controlling industrial and residential pollution in rivers, lakes, and reservoirs; (ii) reforming water supply utilities management; and (iii) reforming water pricing mechanisms. The Project was developed in the context of this strategy.

9. The project design was generally sound and the formulation was adequate. Stakeholders were consulted during planning, design, and implementation. The project scope and components were based on the feasibility studies,² which concluded that the most cost-effective way to meet water demand was to construct a multipurpose storage dam. The feasibility studies highlighted that the existing water shortage in Wenzhou was already serious and would become critical within 5 years. The independent Dam Panel, established under the ADB TA, supported this conclusion and helped develop technical design criteria and safety measures for the Project. In addition, ADB constituted the Environmental and Resettlement Advisory Board to provide an overview of the environmental and resettlement issues associated with the Project. The implementation arrangements devised under the TA were satisfactory. The project benefits consist of provision of safe and sufficient quantity of water, flood protection, more irrigation water, and provision of peaking power.

B. Project Outputs

10. The project components were fully completed as envisaged at appraisal. The outputs anticipated at appraisal included (i) a 132 m high storage dam at Shanxi town with a 200 MW

² The ADB-financed feasibility study (footnote 1) built on an earlier feasibility study carried out by SEDC.

hydroelectric generating plant, related diversion tunnels, electrical transformer station, and transmission facilities; (ii) a 16 m high diversion dam at Zhaoshandu town with a 20 MW hydroelectric generating plant and related electrical transformer station and transmission facilities; (iii) 61.8 km gravity flow water conveyance system including tunnels, structural aqueducts, pipes, and inverted siphons; and (iv) capacity building for SEDC and the responsible WMG bureaus. All project facilities were constructed as planned at appraisal, passed the final acceptance requirements, and received commendation from provincial authorities for their high quality standards.

11. The Shanxi storage dam was completed in December 2001. The major structures including embankment, chute spillway, tunnel spillway, power tunnels, and power station were tested successfully and are now in full use. However, the chute spillway has not been fully tested because the last three typhoon seasons produced less rain than expected. The highest reservoir water level in 2001, 2002, and 2003 was 3 m less than the level required for a spillway test. The gates and spillway can only be fully tested when the reservoir level reaches full capacity, possibly during the next typhoon season if rains are heavy. Instrumentation readings indicate that the embankment has behaved as designed with no concerns about safety. All four units of the power station are operating as designed, and power is being supplied to the Zhejiang grid.

12. The Zhaoshandu diversion dam and the water conveyance system were completed in May 2000. The major structures include a gravity dam, 16 flood release gates, barrier dam, and two power-generating units. The main power station was commissioned and power is being generated. The 61.8 km water conveyance system including the 51.9 km of tunnel to the Wenzhou and Ruian delivery points was completed and commissioned. Water is being delivered to a pumping station at Chen Ao in Wenzhou.

13. The institutional capacity of the newly established SEDC was strengthened. This company was initially established as a publicly owned corporation to manage the project construction and development. Transformed into an operating company, it has completed an international training program for staff, followed by on-the-job training at a similar facility in the PRC. The training program covered operations, administration, and finance. Management systems involving documented regulations and procedures for training, supervision, communications, and reporting have been developed for operations, safety, and equipment maintenance and repair. Accounting and finance departments have been established. The accounting system conforms to PRC laws and internationally accepted standards. Standard internal financial controls are in place. Annual audits performed under the Loan Agreement have contributed to capacity building by uncovering weaknesses and errors that SEDC is rectifying. Similarly the institutional capacity of the responsible WMG bureaus has been strengthened, including the Wenzhou Resettlement Office (WRO).

C. Project Costs

14. The total project cost was estimated at \$518.0 million equivalent³ including foreign exchange costs of \$111.5 million. The actual cost was \$437.0 million equivalent,⁴ an underrun of \$81.0 million equivalent or 16% of the original estimate. The cost underrun is attributable to major savings in procurement of civil works, materials, and equipment, as well as unused contingencies. The foreign exchange cost was \$37.0 million. Some contract packages were

³ In 1997 prices at an exchange rate of \$1.00 = CNY8.3.

⁴ The costs were converted at average exchange rates for the years of disbursement.

financed by local rather than loan funds, which resulted in reduced foreign exchange cost requirements. Local financing became necessary due to the delays in loan effectiveness. Some loan savings were also obtained through low prices resulting from international competitive bidding for procurement of materials and equipment. The actual cost of resettlement was higher at completion due to the increased scope of compensation. The actual cost of consulting and training was lower at completion due to the overestimation of consultants' inputs. Appraisal and actual costs are compared in Table 1.

Table 1: Project Cost at Appraisal and Actual Project Cost
(\$ million)

Description	Appraisal			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
A. Base Costs						
Civil Works	0.00	141.92	141.92	0.00	162.92	162.92
Metal Structures	6.16	6.24	12.40	3.21	9.08	12.29
Electrical and Mechanical	21.91	14.72	36.63	18.58	28.20	46.78
Transmission Works	2.05	13.82	15.87	0.00	9.26	9.26
Project Management	0.00	8.78	8.78	0.00	1.13	1.13
Survey and Design	0.00	11.62	11.62	0.00	5.40	5.40
Consulting and Training	1.20	2.06	3.26	0.73	1.87	2.60
Resettlement	16.59	100.93	117.52	0.00	137.58	137.58
Environment	0.00	1.54	1.54	0.00	9.00	9.00
Construction Equipment/Materials	37.23	0.00	37.23	7.59	0.00	7.59
Taxes and Duties	0.00	25.78	25.78	0.00	0.00	0.00
Subtotal	85.14	327.41	412.55	30.11	364.44	394.55
B. Contingencies						
Physical	5.25	30.40	35.65	0.00	0.00	0.00
Price	4.16	44.13	48.29	0.00	0.00	0.00
Subtotal	9.41	74.53	83.94	0.00	0.00	0.00
C. IDC and Other Charges	16.90	4.57	21.47	6.86	35.85	42.71
Total	111.45	406.51	517.96	36.97	400.29	437.26

IDC = interest during construction.

Source: Shanxi Economic Development Company.

15. Project financing was generally provided as envisaged at appraisal, with increased use of local financing sources due to delays in loan effectiveness. Planned and actual financing are compared in Table 2.

Table 2: Planned and Actual Project Financing

Item	Appraisal	Actual
Equity	30	33
Asian Development Bank Loan	20	8
Local Bank Loans, Bonds	0	59
Shareholder Advances	50	0
Total	100	100

Source: Shanxi Economic Development Company

16. The major change from SEDC's shareholder advances to local bank loans⁵ reflects a change in the terms offered by local banks and a scarcity of internally generated funding on the part of shareholders.

D. Disbursements

17. Proceeds of the loan were withdrawn in accordance with ADB's standard disbursement procedures. To facilitate disbursements for numerous small expenditures, an imprest account was planned under the Project, but this was not established because most small expenditures were financed by local funds. The accounting staff of SEDC received training on ADB disbursement procedures. Most project goods and services were disbursed under direct payment procedures. Actual quarterly disbursements for the ADB-financed part of the Project are in Appendix 3.

18. Disbursements were slow at the early stage of project implementation. With initial delays in loan effectiveness, the first disbursement was made in the first quarter of 1999. The disbursement rate picked up significantly in the third and fourth quarters of 1999, reflecting major contract awards for materials and equipment in the first and second quarters of 1999. The loan was extended twice, first to 31 March 2003 and then to 30 June 2003, with total extensions of 12 months. The extensions were required mainly to complete the international training, which was delayed due to the occurrence of severe acute respiratory syndrome in 2003. Before the loan account closed on 31 July 2003, \$37.0 million was finally withdrawn. This resulted in cancellation of \$63 million of the \$100 million loan. This substantial cancellation occurred because domestic loans had more attractive lending terms and less complicated procurement and disbursement procedures than the ADB loan.

E. Project Schedule

19. The loan was approved in September 1997 and became effective in February 1999, 14 months later than envisaged. At appraisal, physical implementation was scheduled to start in July 1997 and be completed by December 2001, with an implementation period of 4.5 years. Despite the delayed loan effectiveness, construction started and was completed almost as scheduled. This was attributable to the good progress made on the preparatory works including detailed engineering design, bidding documents, and some minor civil works. The reasons for the initial delay in loan effectiveness were the longer than expected time required for signing relending and onlending agreements, and the turnover of ADB's loan portfolio from the People's Bank of China to the Ministry of Finance in 1998. The schedule envisaged at appraisal and actual implementation schedule are compared in Appendix 4.

F. Implementation Arrangements

20. The Executing Agency, the Zhejiang provincial government (ZPG), had overall responsibility for the Project. A leading group comprising the vice governor of ZPG, heads of relevant provincial departments, and representatives from WMG and SEDC provided overall guidance during implementation. SEDC was responsible for day-to-day activities and construction management through its project management office. SEDC is a limited company incorporated under the PRC's Company Law. As a corporate body, SEDC is governed by a

⁵ Comprising bonds with an interest rate of 4.75%, National Development Bank with an interest rate of 6.21%, and short-term loan with an interest rate of 5.58%.

board comprising directors appointed by its government shareholders.⁶ The board, chaired by the vice mayor of Wenzhou City, meets at least twice a year to review the work performance, approve plans for upcoming project investments, and deal with problems that arise.

21. As a construction company, SEDC performed well, keeping project development on schedule and under budget. SEDC has now been transformed into a utility operator, with a new organizational structure reflecting the new operational role. It now has three divisions: Shanxi Power, Zhaoshandu Power, and Zhaoshandu Water. Staffing levels are being increased to 197 from the 175 during the construction phase. This represents a significant and commendable reduction over the original staffing plan stipulating 370 persons.

22. As part of the restructuring, new administrative regulations and procedures have been or are being developed for power production, safety, equipment repairs and maintenance, and finance. A coordinated operating plan for the reservoirs has yet to be developed. Such a plan is strongly recommended as a means of minimizing conflicts between competing users and maximizing water use benefits.

23. Various aspects of operation, including hiring and budgeting, are managed in a manner that reflects a private enterprise outlook. However, tariff approvals and, consequently, the revenue budget are still heavily influenced by political interventions that keep tariffs low. The existing regulatory process is closely tied to the Government and, as such, does not mediate between commercial interests and the public interest in a balanced manner. Government intervention is also evident in salary levels, which are based on official guidelines. Such intervention is understandable considering the institutional framework within which SEDC operates. Reducing this sort of intervention will allow the company to operate more efficiently. Apart from government interventions, which affect financial performance, implementation arrangements are adequate to deliver project outputs and achieve the project objectives.

G. Conditions and Covenants

24. The delay in loan effectiveness was caused by the unexpected length of time required for signing relending and onlending agreements. Provincial and municipal governments were unfamiliar with relending and onlending procedures and associated guarantee procedures. The turnover of ADB's loan portfolio from the People's Bank of China to the Ministry of Finance in 1998 also contributed to the delay. The relending agreement between the Ministry of Finance and ZPG, the onlending agreement between ZPG and WMG, and the further onlending agreement between WMG and SEDC were all signed in January 1999. The National Council approved the Loan Agreement in October 1998; this was another condition for loan effectiveness.

25. Major loan covenants concerning implementation, resettlement, construction quality, environmental mitigation, and tariff reviews were complied with (Appendix 5). However, the benefit monitoring covenant was only partly complied with. A project benefit monitoring system was developed but needs improvement, particularly in the area of health data. Furthermore, compliance with some covenants relating to the follow-on project and financial aspects was delayed. Completion of the follow-on project (para. 36) was scheduled to synchronize with project completion. In retrospect, this target was too ambitious. Most of the water and power

⁶ Wenzhou Da Jiangnan Development Company Ltd., Zhejiang Financial Development Company Ltd., Zhejiang Investment Company for Water Conservancy and Hydroelectric Power Construction, and Zhejiang Electric Power Development Company. All shareholders are government-owned entities.

purchase agreements are close to being finalized but final signing has been delayed because the follow-on project is not complete. The participating municipal governments in the follow-on project want to sign the water purchase agreements upon completion of the Project. SEDC has yet to contribute to the postrelocation support fund.

26. The SEDC water tariff is set at CNY0.45/m³, a level far below the CNY1.096/m³ tariff indicated in the relevant covenant. In hindsight, the tariff specified in the covenant is unrealistically high, and thus the lower tariff is acceptable. However, the current level is too low to achieve healthy financial performance in the near term. The low tariff is the result of a tariff adjustment process that emphasizes social considerations at the expense of the financial well-being of SEDC. The treated water tariffs have been adjusted upward since appraisal, as required by relevant covenants.

27. Full compliance with the financial covenants is not expected in the near term. This is due to the initially very high fixed costs for debt service over the first decade and a decision by WMG to approve a low tariff. The resulting revenue shortfall leaves SEDC with insufficient cash to service debt and fully finance the reserve fund accounts stipulated in the covenants.

H. Related Technical Assistance

28. The Project was complemented by a small-scale TA for a research and breeding program for sweetfish, which have a classification II from the National Committee for Protection of Wild Animals. Sweetfish were under pressure and their numbers declining due to increasing pollution and low dissolved oxygen levels in the lower reaches of many coastal rivers. The TA was to (i) review and recommend strengthening of national policy and strategy for preserving sweetfish; (ii) update the 1998 assessment of sweetfish in the Feiyan River; (iii) review and recommend improvements to the research and breeding program for sweetfish proposed by Ningbo University; and (iv) review and recommend improvements in the marketing of the fish produced. The TA's final report concluded that the key objectives were achieved, and recommended law enactment and enforcement for commercial breeding.⁷ For the TA, two sweetfish specialists—one international (for 2.8 person-months) and one domestic (for 2.5 person-months)—were engaged as individual consultants in accordance with ADB's *Guidelines on Use of Consultants*. Their performance was highly satisfactory.

I. Consultant Recruitment and Procurement

29. For detailed engineering design and construction supervision, SEDC retained domestic design institutes and construction supervision companies, following normal competitive recruitment procedures. SEDC engaged international project management consultants to provide support in project implementation and supervision through a firm in accordance with ADB's *Guidelines on the Use of Consultants*. The consultants provided a total of 27 person-months compared with 20 envisaged at appraisal. SEDC also engaged four international consultants to form the Dam Monitoring Panel and two international consultants to form the Resettlement Monitoring Panel as individual consultants in accordance with ADB's *Guidelines on the Use of Consultants*. Their estimated inputs of 6 and 10 person-months respectively were not fully utilized because of an overestimation of the inputs required. No deviations from agreed procedures in consultant selection were noted.

⁷ ADB. 2002. *The Zhejiang Sweetfish Research and Breeding Report*. Manila.

30. ADB approved advance action and retroactive financing in June 1997 to allow procurement of dam monitoring equipment and safety systems, and specialized construction equipment. These were necessary to meet a tight construction schedule before the rainy season and the resulting high flows in the river. Despite the approved advance action, SEDC was unable to follow the time-consuming ADB procurement procedures. As timing of these packages was critical, they were financed by local funds.

31. The loan financed the procurement of mechanical and electrical equipment related to the two hydroelectric power plants; construction materials including steel plate, reinforcing steel, and cement; and some construction equipment. SEDC engaged the services of an experienced tendering company, and the materials and equipment were procured in accordance with the ADB's *Guidelines on Procurement*. The Project required 15 contracts of which 8 were awarded through international competitive bidding and 7 through international shopping. The details of the contracts financed by ADB and mode of procurement are in Appendix 6. No major problems were encountered in packaging of contracts, preparation of bidding documents, or evaluation of bids. No disputes or contractual difficulties were noted.

J. Performance of Consultants, Contractors, and Suppliers

32. The domestic consultants for detailed engineering and construction supervision completed engineering design and preparation of bidding documents, and conducted construction supervision. SEDC was satisfied with the performance of the consultants. The international project management consultants' services included provision of training on ADB procedures and reporting, preparation of documents in accordance with international specifications, quality control, environmental risk control and management, and development of a project benefit monitoring and evaluation system. The consultants also provided training for capacity building necessary to improve the operational efficiency of SEDC. SEDC confirmed that the consultants' suggestions and recommendations were useful, particularly on environmental management aspects. Regarding the performance of the dam and resettlement panels, SEDC indicated that the Dam Panel's suggestions and recommendations were useful in assuring construction quality and dam safety, and that the Resettlement Panel's inputs were useful in meeting ADB's requirements.

33. Civil works were built by domestic contractors, whose capacity in planning and construction proved adequate to meet the implementation schedule. The works were completed satisfactorily and in accordance with contract specifications. SEDC rated contractor performance as satisfactory. Similarly the performance of the suppliers of construction materials and equipment was satisfactory. Materials and equipment were provided in accordance with the terms and conditions of the applicable contracts.

K. Performance of the Borrower and the Executing Agency

34. The performance of the Borrower and ZPG was satisfactory. The Borrower and ZPG generally fulfilled their obligations during project implementation and communicated with ADB regularly. ZPG displayed strong leadership by providing timely policy decisions, systematic coordination, and necessary and sufficient funds to implement the Project.

L. Performance of the Asian Development Bank

35. The overall performance of ADB was satisfactory. ADB monitoring comprised nine review missions for a total of 190 staff days, and was considered adequate. ADB worked closely with the Government to resolve implementation issues, including extension of the loan closing date and cancellation of ADB loan savings. During project implementation, ADB's review missions helped SEDC resolve many implementation problems, particularly those relating to procurement and disbursement. Further, ADB established the independent Dam Panel and provided technical support to the Project. In addition, ADB constituted the Environmental and Resettlement Panel and provided overview of the environmental and resettlement issues associated with the Project. Through policy dialogue, ADB supported cost recovery, commercial operations, and proper wastewater disposal. The current level of the water tariff is too low to achieve healthy financial performance in the near future, and ADB has continued a dialogue with the Government on full cost recovery. However, the Government has adopted a low tariff, emphasizing social considerations at the cost of SEDC's financial well-being.

M. Follow-On Project

36. The Project was designed to provide 3.1 million m³/day of raw water to the Wenzhou coastal plain region. Of this volume, 1.8 million m³/day is allocated to urban water supply companies in Wenzhou, Rui'an, and Pingyang; and 1.3 million m³/day to irrigation. Improved and expanded urban water supply infrastructure is required to distribute the increased water supply. The existing capacity connected to the SEDC raw water supply system is 330,000 m³/day. Additional capacity was expected to be provided under a separate project, previously identified as phase II, and planned as a follow-on project to receive ADB loan funding. Although the follow-on project was prepared by ADB, ZPG did not pursue loan funding, possibly because of the comparatively high cost of ADB loans at the time and the perceived administrative burden of ADB implementation procedures. Urban water supply investments in the project area nevertheless continue. Available information indicates that by 2015 the connected water treatment plant capacity will approach 82% of the total SEDC volume allocated to urban water supply and average demand will be approximately 1.1 million m³/day with those plants operating at full capacity (Appendix 7).

III. EVALUATION OF PERFORMANCE

A. Relevance

37. The Project is rated highly relevant. At appraisal, the Project was formulated in line with the Government's development strategy for the water resources development and urban water supply sector and ADB's country strategy for the PRC. The project objectives remained unchanged throughout implementation, particularly in the context of good quality water resources development and institutional capacity building. Key elements of Government policy that are still in force include development of water resources and environmental protection, corporate governance, and tariff reform.

B. Efficacy in Achievement of Purpose

38. The Project is considered efficacious. It has achieved most project objectives as envisaged at appraisal: increase in provision of good quality water for municipal, industrial, and agricultural use; increase in flood protection for 1 in 10 years to 1 in 100 years; and provision of clean and efficient hydropower to the Wenzhou Grid. However, due to the delays in the follow-

on project, benefits of the increased provision of good quality water have not been fully delivered as envisaged at appraisal. Tangible outcomes relating to resettlement and environmental protection have been produced with a large measure of success. Institutional capacity building has been successful. SEDC is an incorporated enterprise with an effective management structure and an almost fully developed set of policies and procedures for operations and administration. Tariff reform reflects current national legislation in terms of institutional arrangements but not in terms of tariff levels. Irrigation water is provided free of charge, and raw water for urban water supply is sold at a tariff level that is too low to fully recover costs in the near term. The Project is likely to achieve the development goal of alleviating the water crisis in Wenzhou Prefecture in the long term.

C. Efficiency in Achievement of Outputs and Purpose

1. Efficiency of Investments

39. The Project is considered efficient. This rating is a result of the lower than expected economic efficiency of investments. The financial internal rate of return (FIRR) exceeds the weighted average cost of capital, but the economic internal rate of return (EIRR) does not meet the ADB threshold value of 12%.

40. The FIRR was calculated for the Project as a whole. The approach remained essentially unchanged from that used at appraisal. Costs include the costs of infrastructure investments and operations. Revenues were associated with the sale of raw water and power. The estimated FIRR for the Project as a whole was 5.2% (Appendix 8). This is more than the weighted average cost of capital of 2.9%. At appraisal, the FIRR was estimated to be 8.5%.

41. The EIRR was estimated for the overall Project. Costs included in the EIRR analysis were adjusted to reflect the shadow exchange rate value of tradable goods. Project benefits were based on the estimated value of flood damages and the willingness-to-pay for urban water supply and power. The values assumed for willingness-to-pay are based on the current retail tariffs net of variable treatment and distribution costs incurred to process the raw water supplied by SEDC. The economic analysis did not assign value to benefits associated with the reduced risk of exposure to waterborne pathogens in local sources of urban water supply that are abandoned. The estimated EIRR for the Project is 9.4% (Appendix 9). This is below the ADB threshold value of 12%. At appraisal, the EIRR was estimated at 5.5%.

42. Estimates of both the FIRR and EIRR are lower than the appraisal estimates because (i) the assumed water and power tariffs at appraisal were much higher than now, and (ii) sales volumes are lower and water sales grew more slowly than anticipated. The current sales assumptions are reasonable.

43. The cost-effectiveness of the Project was evaluated at appraisal and was not reassessed during the Project Completion Review Mission (PCRM). The Project is assumed to be cost-effective since no viable alternative sources of water are available and it was optimized during design.

2. Efficiency of Process

44. The Project was processed efficiently to meet the Government's requirements. Processing by ADB took only 19 months from the project preparatory TA fact-finding to loan

approval, which is 7 months less than the ADB average processing time. Project management was also highly effective. Consultants were recruited on time, and most civil works and supply contracts were procured as scheduled. Adequate counterpart funding was provided in a timely manner.

D. Preliminary Assessment of Sustainability

45. The investment is rated as likely sustainable. This rating reflects a satisfactory performance for most of the sustainability criteria. The Project uses a technically well-conceived design to satisfy multiple objectives. It efficiently exploits a renewable water resource to produce clean energy, reduce flooding, and satisfy water demands. It has received strong public support as a result of the benefits that are already clearly evident to beneficiaries.

46. Sustainability has been enhanced by the presence of a professional management team and a skilled work force supported by ongoing training. Management has developed repair and maintenance regulations and procedures that will protect the function and value of infrastructure assets over time. WMG, the owner of SEDC, is proud of the Project and committed to the ongoing viability of the enterprise.

47. The only weak link is financial sustainability. Tariffs are currently too low to fully recover costs or meet cash requirements in the near future, although they generate a reasonable return to equity over the life of the Project. Institutional arrangements give the Zhejiang Provincial Price Bureau and Wenzhou Municipal Price Bureau lead roles in the tariff adjustment process, thus weakening SEDC's ability to plan and manage its revenues. Current tariffs, adjusted to match inflation, will achieve full-cost recovery within several years, and will generate sufficient cash to fund equipment maintenance, repairs, and replacements. Reforms called for by new national laws and regulations governing water tariffs, if followed by local authorities, will result in project tariffs that strike a better balance between SEDC's commercial interests and social objectives.

E. Environmental, Sociocultural, and Other Impacts

1. Environmental Impact

48. The environmental impact assessment report approved by ADB in May 1997 identified major potential impacts on water quality, reservoir and river hydrology, reservoir operations due to sedimentation, and the estuary downstream of the project areas. During project implementation, in December 2000, the Water Resource Protection Plan was developed as an action plan for the environmental impact assessment. The Project was inspected and approved by the National Environmental Protection Administration in October 2003.

49. To maintain water quality at both reservoirs (Shanxi and Zhaoshandu) within acceptable ranges for municipal water supply, strict limits have been placed on the use of the reservoir and feeder streams. A program for the provision of regional wastewater treatment and solid waste management facilities was implemented in coordination with resettlement activities. This program will improve public health and the environment. Existing water quality generally meets municipal water supply standards but needs improvement with respect to some water quality indicators. In line with this, the inspection team from the National Environmental Protection Administration suggested that a drinking water source protection area be defined at Zhaoushandu and necessary administrative measures and/or legal actions be taken to protect

the drinking water source. WMG has already acted on this recommendation and has applied to certify a water quality protection zone for Zhaoushandu.

50. The monitoring program developed under the Water Resource Protection Plan, combined with other monitoring programs enabled the Wenzhou Environmental Protection Bureau to conduct a thorough assessment of environmental impacts within the catchment. This in turn allowed the Wenzhou Environmental Protection Bureau to measure the degree of success of protection works, including wastewater treatment and solid waste facilities, against indicators in the plan. However, the plan was restricted to the project area and did not include issues related to the river downstream of Zhaoushandu. Further benefits could have been obtained through transfer of experience and successes from the catchment upstream of Zhaoushandu to the catchment below.

51. After construction, monthly average flows released by the dams have been maintained at levels required to support water use by downstream cities and counties, and to sustain ecological functions. An extensive tree-planting program was implemented to control soil erosion and thereby prevent loss of storage capacity by sedimentation behind the dams. This used aerial seeding in combination with manual and natural revegetation of cleared areas. The program provided substantial benefits to the catchment environment by reducing erosion, protecting water quality, and providing natural habitat. Forecast impacts on the estuary were investigated and found to be minor. Finally a significant and adverse environmental impact from the Project is expected as a result of increased wastewater generated by cities receiving water from SEDC. WMG is aware of this and of the need to improve treatment facilities. Construction of wastewater treatment plants for cities and/or counties receiving the raw water is included in the Government's Tenth Five-Year Plan (2001–2005) is being carried out with some delays due to the financial difficulties experienced by the cities and/or counties.

2. Social Impact

52. Social impacts are expected to be beneficial. The social impacts of the Project envisaged at appraisal remained largely unchanged. The Project will reliably supply up to 1.8 million m³/day of good quality raw water to the urban areas in Wenzhou Prefecture, thus ending reliance on inadequate local sources of badly polluted water. It will eliminate the recurring annual floods in the lower Feiyun River valley, and provide protection to 250,000 persons against floods up to a 1 in 20 year return frequency. The Project will also supply irrigation water to 60,000 hectares of rain-fed cropland that experience some degree of drought every 3 to 4 years. The installed peak-load capacity of 220 MW of hydroelectric power will supply clean renewable energy and increase the security of supply for domestic and industrial consumers. No unanticipated indigenous people/ethnic minority issues were encountered during implementation.

53. Possible adverse social impacts may result from a low water tariff policy. Water supply customers who are accustomed to low tariffs oppose tariff adjustments, and governments often yield to this opposition. In the long run, low water tariffs impair the revenue sufficiency of water supply companies and cause them to cut back on infrastructure repair and maintenance activities in an effort to balance budgets. Deteriorating infrastructure causes a decline in the quality of service. This in turn increases public resistance to tariff increases since consumers are not willing to pay for poor service. The outcome can be an unsustainable water supply operation.

54. Low water tariffs for irrigation water or, in the current case, zero tariffs can have the same long-term impact on infrastructure sustainability. In addition, low tariffs for irrigation water

can harm the poorest farmers, who are frequently located on marginal lands at the end of water supply canals. Low tariffs promote the wasteful use of irrigation water and can mean that farmers at the ends of supply systems actually receive less water and earn less income than they would, if they, and everyone else, had to pay a realistic tariff for the water that they use.⁸

55. The PCRМ did not evaluate the affordability of higher water tariffs. However, affordability was determined not to be an issue at appraisal when anticipated tariff increases were much higher than they are now. Thus, the affordability of current tariffs is not considered to be a problem.

3. Resettlement

56. The resettlement program was successful. A resettlement plan prepared by a domestic design institute in December 1995 and reviewed by ADB in 1997 indicated that the Project would partly or fully affect 37,256 people from 100 administrative villages; these people would need to be relocated, including 32,516 in the Shanxi reservoir inundation area, 4,732 in the Zhaoshandu reservoir inundation area, and 368 people at the dam sites.

57. The resettlement budget provided in the resettlement plan at appraisal was CNY920.1 million. The budget was revised in 2001, due to (i) changes in resettlement policies that increased compensation for replacing homes and moving; (ii) increases in the estimated value of submerged assets in the inundation areas; (iii) increases due to inflation; and (iv) increases caused by design changes. In 2001, the Zhejiang Province Planning Committee approved a revised resettlement budget of CNY1,138,915 million. By April 2001, CNY974.4 million (85.5%) had been disbursed. About CNY80 million in project savings will be transferred to a postrelocation support fund to help relocated households restore their income and livelihoods.

58. Resettlement was carried out in accordance with the resettlement plan and local regulations. The plan's resettlement strategy emphasized relocation of people to the coastal plain to improve their socioeconomic conditions and reduce poverty. As of December 2003, 37,199 people were determined to be affected, a decrease of 57 from the original estimate. These people were moved to 123 resettlement sites in 10 counties or districts within Wenzhou city. About 74% (27,432) were relocated to agricultural sites and 26% (9,767) were resettled to nonagricultural sites. In total, 31,248 (84%) moved to the coastal plain and 5,951 (16%) relocated around Shanxi reservoir. Relocation decisions were made after households received help from a participatory program. Construction of new houses and public infrastructure at the relocation sites is finished. WMG approved the resettlement completion report in October 2002. Final approval by ZPG is expected in the near future.

59. Based on a sample survey (38 of the 123 resettlement sites) the PCRМ observed that living conditions and livelihoods of most of the relocated people have improved. The average annual income per capita in 38 resettlement villages was CNY4,851, 2.73 times the level of CNY1,778 in 1996. Relocated people have more job opportunities in their new communities than in their old villages. Housing quality has improved and the average house size has increased from 36 m² per capita in 1996 to 50 m² in 2003. The quality of public facilities including water supply, electricity, drainage, roads, television, schools, hospitals, and markets has improved. The Project has therefore contributed to poverty reduction.

⁸ Hussain, Intizar. 2004. *Have Low Irrigation Service Charges Disadvantaged the Poor?* Available: <http://www.adb.org/Documents/Events/2004/Water Week>.

60. About 11% of affected households have not been able to restore their 1996 income levels. The worst-off households in this group resettled in villages around the reservoir or in self-selected relocation sites. The PCRMA asked WRO to conduct a detailed survey of all resettled households to identify households that have not achieved their previous income level, and to focus WRO efforts on these households.

61. The WRO prepared a postrelocation support plan (PSP) in 2002. The PSP outlines policies, principles, measures, and a budget for a 10-year plan; and identifies institutional arrangements for plan implementation. The total PSP budget is CNY404 million. The WMG approved the PSP in March 2003, and requested that WRO implement the PSP with funding support from SEDC. However, SEDC has not contributed to the postrelocation support fund since 2001. For the resettlement to continue to achieve its objectives, SEDC should be required to contribute to the postrelocation fund to fully support the activities of WRO and the county resettlement offices. If SEDC revenues are inadequate due to the low tariffs, the funding responsibility for the PSP should be transferred to WMG. A summary resettlement completion report is in Appendix 10.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

62. Overall, the Project is rated successful. It was highly relevant to the Government's development strategy and ADB's sector policy in the PRC. It was efficacious in achieving project purpose and objectives, and was efficient in the implementation process, though the investment itself was less efficient due primarily to the impact of lower raw water sales on the FIRR. The Project is rated sustainable in all aspects except finance, which suffers due to WMG tariff policies. The resettlement process was largely successful with most resettled households having achieved or surpassed their previous income levels. Environmental impacts have been largely positive and all necessary mitigation measures were taken for the negative environmental impacts. Immediate social impacts have all been positive, although some adverse social impacts could occur over the longer term due to the low tariff policies. Institutional development and other impacts were moderate. The improvement in ZPG's ability to make effective and efficient use of its financial resources in pursuing economic activities prompted by the Project was less than expected. Appendix 11 summarizes the project rating analysis.

B. Lessons Learned

63. A key element in the Project's success, particularly for the physical components, was the Government's strong commitment. This ensured that schedules were kept, procedures adhered to, and guidance at the highest level was given when necessary. Project preparation involved extensive consultation between various departments, bureaus, and offices of the Government and ADB. Implementation was planned in detail and undertaken through effective supervision, monitoring, and cost control.

64. Generally, the resettlement implementation was carried out successfully, which was due to various reasons: strong commitments and efforts from local government; preferential treatment of the affected people; and following an income restoration strategy that took advantage of rapid economic growth in Wenzhou city. The resettlement was carried out with a relatively modest budget. This was possible by sharing the burden with the host population.

Host farmers were prepared to give up land in return for urban registration. Such practice may not occur today, as advantages for urban registration now are less. At the time, the opportunities to get more stable employment, and better education and health care were an attraction for the host population.

65. Terms and phrasing in financial covenants were in some instances found to be vaguely defined or ambiguous. For example, the term “net revenue” was used without definition. References to general cash reserve balances and the retention and debt service accounts were difficult to understand. The nomenclature for certain reserve fund accounts implied funds for construction and maintenance, while they were in fact meant to finance ongoing resettlement efforts. Greater care in drafting covenants would help prevent potential misunderstandings.

66. Several financial covenants were highly prescriptive. For example, financial covenants stipulated how cash reserves should be managed to ensure adequate debt servicing. However, such requirements cannot be effectively monitored as they concern operating decisions and actions that occur after project completion, and did not effectively improve ADB’s capacity to enforce good financial management practices in SEDC. The other example relates to having a fixed tariff at completion. Calculations of a tariff should be based on many factors including water demand and consumption, projects cost, implementation period, and Government policy on tariffs.

C. Recommendations

1. Project Related

67. Project activities requiring follow-up include the following:

- (i) The chute spillway at Shanxi Dam has not been fully tested because recent typhoon seasons produced insufficient rain. The gates and spillway need to be fully tested when the reservoir water level reaches full capacity, possibly during the next typhoon season with heavy rain.
- (ii) A coordinated operating plan for the reservoirs needs to be developed to minimize conflicts between competing users and maximize water use benefits.
- (iii) A drinking water source protection area should be defined at Zhaoushandu and further administrative and/or legal measures implemented to protect the water source for drinking.
- (iv) The PSP needs to be revised in consultation with those affected by the Project to incorporate the additional households that have not achieved their previous income level; and be implemented by WRO with funding support from SEDC. In line with this, SEDC should contribute immediately to the fund and if SEDC revenues are inadequate, funding responsibility for the PSP should be transferred to WMG. WRO should report to ADB on PSP implementation.
- (v) Every effort should be made by WMG and SEDC to overcome the initial poor financial performance of the Project. SEDC tariffs should be reviewed annually and adjusted to at least keep pace with inflation. Progress in expanding raw water sale volumes should be closely monitored, and WMG should develop

water purchase agreements with urban water supply companies as quickly as possible.

- (vi) The policy of free irrigation water should be reconsidered as it is not consistent with national policy. Moreover, it may actually do more harm than good to agriculture and the regional economy over the long term.

68. If ADB selects the Project for a project performance audit review, the review could be undertaken in 2007 or 2008. By that time, the follow-on project would be completed and the project facilities may have reached their full capacities. The review should assess whether affected persons indeed restored and improved their standard of living.

2. General

69. Based on key lessons learned from the Project, the following general recommendations are made for future ADB projects:

- (i) For a large dam project, establishing an independent dam panel within ADB is essential to provide support for technical design criteria and safety measures. Similarly constituting an environmental and resettlement advisory board is necessary to provide an overview of the environmental and resettlement issues associated with the project.
- (ii) Initial delays are common in social infrastructure projects in the PRC. These could be avoided by better synchronization between ADB and domestic relending and onlending procedures, and more discussions with the executing and implementing agencies on the relending and onlending requirements during appraisal.
- (iii) If an estimated full-cost raw water tariff is to be written into financial covenants as a firm target to be achieved by the project operating authority, the underlying calculations should be based on detailed and accurate project cost estimates. Otherwise, subsequent estimates of the full-cost tariff differing significantly from the appraisal level may be more realistic even if they are not in line with the loan covenant. If reliable estimates of tariffs cannot be made, then covenants should require tariff levels that achieve designated financial targets but should not specify actual tariff levels.
- (iv) Financial covenants dealing with cash management should not be overly prescriptive, especially if the executing agency cannot be effectively monitored. Covenants that cannot be monitored do not effectively improve ADB's capacity to enforce good financial management practices.

CHRONOLOGY OF MAJOR EVENTS

1997	May–June	Loan appraisal
	September	Loan approval
1998	July	Loan Agreement signed
	September	Award of Shanxi power station: 4 x 50 MW Francis turbines plus generators, exciters, and inlet valves
	October	Award of Zhaoshandu Power Station: 2 x 10 MW bulb turbines plus generators
	November	Award of supply of construction equipment for first stage: shovel excavators
	November	Award of supply of construction equipment for first stage: wheeled loader
	November	Award of construction equipment for first stage: 7 off-road dump trucks
	November	Award of supply of construction equipment for first stage: 2 crawler rock drills
	November	Award of supply of construction equipment for first stage: 2 self-propelled vibratory rollers
	November	Award of supply of construction equipment for first stage: 2 self-propelled vibratory rollers
	November	Award of supply of hydraulic hoists for radial (tainter) gates
	November	Award of supply of steel for metal structures
1999	January	Award of supply of trunnion bearings for radial (tainter) gates
	February	Loan effectiveness
	May	First disbursement
	May	Award of Shanxi power station: 10.5/220 kV power transformers and auxiliary electrical equipment
	May	Award of computerized monitoring system in Shanxi Reservoir
	May	Award of Shanxi power station: generator circuit breakers
	June	Delivery of supply of construction equipment for first stage: wheeled loader
	June	Delivery of construction equipment for first stage: 7 off-road dump trucks
	June	Delivery of supply of construction equipment for first stage: 2 crawler rock drills
	June	Delivery of supply of steel for metal structures
	July	Delivery of supply of construction equipment for first stage: shovel excavators
	July	Delivery of supply of construction equipment for first stage: 2 self-propelled vibratory rollers
	July	Delivery of supply of construction equipment for first stage: 2 self-propelled vibratory rollers
	July	Award of supply of cement for construction
	July	Award of supply of reinforcement steel for construction
	September	Award of dam panel

	September	Award of consulting services for project implementation supervision
2000	May	Completion Shanxi power station: 4 x 50 MW Francis turbines plus generators, exciters, and inlet valves
	May	Completion of Zhaoshandu power station: 2 x 10 MW bulb turbines plus generators
	June	Award of resettlement consultancy
	July	Completion of resettlement consultancy
2001	March	First partial loan cancellation of \$50.00 million
	May	Delivery of hydraulic hoists for radial tainter gates
	July	Delivery of supply of cement for construction
	August	Delivery of Shanxi power station: generator circuit breakers
	November	Delivery of supply of trunnion bearings for radial (tainter) gates
	December	Completion of Shanxi power station: 10.5/220 kV power transformers and auxiliary electrical equipment
	December	Delivery of supply of reinforcement steel construction
	December	Delivery of supply of steel for metal structures
	December	Physical completion
2002	June	First extension of loan closing
	June	Completion of consulting services for project implementation supervision
	July	Completion of dam panel
2003	March	Second extension of loan closing
	April	Second partial loan cancellation of \$10.00 million
	April	Start of commercial operation
	June	Third extension of loan closing
	July	Third partial cancellation of \$3.03 million
	July	Final disbursement
	July	Cancellation of nonutilized loan balance
	July	Closing of loan account

MW=megawatts, KV=kilovolts.

PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks	Progress on Performance Targets
<p>Goal</p> <p>1. To alleviate the water supply crisis in Wenzhou Prefecture</p>	<ul style="list-style-type: none"> • 2.2 million urban residents in the coastal plain areas (1997) • 3.0 million urban residents by 2010 	<ul style="list-style-type: none"> • Improve the existing water supply to Wenzhou, Ruian, and Pinyang by replacing 500,000 m³/d of polluted raw water now being pumped from the local canals, by 2002. • Increase the water supply to Wenzhou, Ruian, and Pinyang: <ul style="list-style-type: none"> (i) 100,000 m³/day by 2002; (ii) 1,080,000 m³/day by 2005; and (iii) 1,770,000 m³/day by 2008 • Supply irrigation water to approximately 60,000 hectares 	<ul style="list-style-type: none"> • Affordability and user's willingness to pay • Viable project design • Adequate precipitation • Adequate and timely relocation of 37,000 people 	<ul style="list-style-type: none"> • Likely to achieve • Likely to achieve
<p>Purpose</p> <p>2.1 Increase provision of good quality water for municipal, industrial, and agricultural use.</p> <p>2.2 Increase flood protection for 1 in 10 years to 1 in 100 years.</p> <p>2.3 Provide clean, efficient hydropower to the Wenzhou Grid.</p>	<ul style="list-style-type: none"> • By 2008, supply 3.2 million m³/day, allocated as follows: municipal 34% industrial 21% agricultural 45% • 250,000 residents residing in the flood plain. • Increase power supply of Wenzhou Grid by 405 gigawatt hours per annum. 	<ul style="list-style-type: none"> • Water supply companies • Bureaus of water resources and irrigation • Bureaus of water resources and irrigation • Wenzhou Electric Power Bureau 	<ul style="list-style-type: none"> • Willingness to pay increased tariffs • Continuing economic and industrial growth in Wenzhou Prefecture • Correct hydrogeological estimates • Sound dam design • Willingness to pay increased tariffs • Electricity demand projections 	<ul style="list-style-type: none"> • Being achieved • Achieved • Achieved

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks	Progress on Performance Targets
			<ul style="list-style-type: none"> • Correct hydrogeological estimates 	
<p>Outputs</p> <p>3.1 Shanxi Storage Dam (flood protection and storage)</p> <p>3.2 Zhaoshandu Diversion Dam (water supply)</p> <p>3.3 Conveyance system</p> <p>3.4 Power houses</p>	<ul style="list-style-type: none"> • Store sufficient water to supply 3.2 million m³/day for municipal, industrial, land agricultural use. • Increase flood protection to 1 in 20 years. • To divert up to 3.2 million m³/day to conveyance system. • 62.8 km of gravity flow tunnels and aqueducts. • One 200 megawatt powerhouse at Shanxi site and one 	<ul style="list-style-type: none"> • International adviser • Regular reports to the Asian Development Bank (ADB) • ADB review missions • Shanxi Economic Development Company (SEDC) shareholders and board of directors • International adviser • Regular reports to ADB • ADB review missions • SEDC shareholders and board of directors • International adviser • Regular reports to ADB • ADB review missions • SEDC shareholders and board of directors • International adviser 	<ul style="list-style-type: none"> • Quality of Dam design and construction. • Availability of local currency financing. • Quality of dam design and construction. • Availability of local currency financing. • Quality of construction. • Availability of local currency financing. • Quality of construction. 	<ul style="list-style-type: none"> • Achieved • Achieved • Achieved • Achieved

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks	Progress on Performance Targets
<p>3.5 Resettlement</p> <p>3.6 Capacity building</p>	<p>20 megawatt powerhouse at Zhaoshandu site</p> <ul style="list-style-type: none"> • Relocate approximately 37,000 persons (10,000 households) from Shanxi and Zhaoshandu reservoirs. • 370 employees of SEDC • 400 staff in the Wenzhou, Ruian, Pinyang, and country resettlement bureaus. • 10,000 resettlers 	<ul style="list-style-type: none"> • Regular reports to ADB • ADB review missions • SEDC shareholders and board of directors • Wenzhou Electric Power Bureau • International adviser and monitors • Domestic advisers • Regular reports to ADB • ADB review missions • Resettlement bureaus, village committees, and other local government agencies. • International advisers • Regular reports to ADB • ADB review missions 	<ul style="list-style-type: none"> • Availability of local currency financing. • Entitlement paid as required on a timely basis • Effective assimilation into the host communities • Training is successful • Safety net/fund is provided • Training is successful • Budgets are sufficient • Adequate economic opportunities 	<ul style="list-style-type: none"> • Achieved. Relocated 37,256 persons. • 197 employees • 400 staff • 10,000 resettled
<p>Activities</p> <p>4.1 Infrastructure</p>	<ul style="list-style-type: none"> • Civil works - \$142 million • Equipment and materials - \$102 million • Environment mitigation - \$2 million 	<ul style="list-style-type: none"> • International adviser • Regular reports to Bank • Bank review missions • SEDC 	<ul style="list-style-type: none"> • Appropriate cost estimates • No need for geotechnical expenses • Sufficient local currency financing 	<ul style="list-style-type: none"> • \$163 million • \$76 million • \$9 million

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks	Progress on Performance Targets
4.2 Resettlement	<ul style="list-style-type: none"> Survey, design and project management - \$22 million \$118 million 	<ul style="list-style-type: none"> shareholders and Board of Directors Various accounts and audits carried out by local authorities International monitors Entitlements ADB review missions 	<ul style="list-style-type: none"> Sufficient budget 	<ul style="list-style-type: none"> \$8 million \$138 million
4.3 Capacity building	<ul style="list-style-type: none"> \$3million 	<ul style="list-style-type: none"> Regular reports to ADB 4.3-4.8 will be monitored through Bank's normal implementation monitoring reporting and review missions 	<ul style="list-style-type: none"> Timely disbursement of entitlements 4.3-4.8 all require sufficient budget and counterpart financing 	<ul style="list-style-type: none"> \$1 million
4.4 Taxes and Duties	<ul style="list-style-type: none"> \$26 million 			<ul style="list-style-type: none"> Nil
4.5 Contingencies	<ul style="list-style-type: none"> \$84 million 			<ul style="list-style-type: none"> Nil
4.6 Interest during construction	<ul style="list-style-type: none"> \$21 million 			<ul style="list-style-type: none"> \$43 million
4.7 Total cost	<ul style="list-style-type: none"> \$518 million 			<ul style="list-style-type: none"> \$437 million
4.8 ADB loan	<ul style="list-style-type: none"> \$100 million 			<ul style="list-style-type: none"> \$37 million

ACTUAL LOAN DISBURSEMENTS
(\$ million)

Year	Quarter	Quarterly Disbursement	Actual Cumulative Disbursement	Percent of Loan
1999	I	0.06	0.06	0.15
	II	3.44	3.50	9.46
	III	4.27	7.76	20.99
	IV	2.04	9.81	26.52
2000	I	4.06	13.86	37.50
	II	3.05	16.91	45.75
	III	6.69	23.60	63.83
	IV	2.10	25.70	69.51
2001	I	2.91	28.61	77.38
	II	0.73	29.33	79.34
	III	2.65	31.98	86.50
	IV	0.39	32.37	87.55
2002	I	1.47	33.84	91.52
	II	0.12	33.95	91.84
	III	1.47	35.43	95.82
	IV	0.12	35.55	96.15
2003	I	1.34	36.89	99.78
	II	0.00	36.89	99.78
	III	0.08	36.97	100.00
	IV	0.00	36.97	100.00
Total		36.97		

Source: Asian Development Bank

IMPLEMENTATION SCHEDULE

Item	1996		1997				1998				1999				2000				2001				
	1	2	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Activities																							
Shanxi Dam: Bidding of Main Contracts																							
Preparatory Works																							
Dam and Spillway																							
Reservoir Impounding																							
Intake and Power Tunnels																							
Power Station																							
Commissioning																							
Zhaoshandu Dam: Bidding Of Main Contracts																							
Dam Construction																							
Zhaoshandu Power Station																							
Bidding-Conveyance System																							
Conveyance System																							
Commencement of Commercial Operations	April 2003																						

 Planned
 Actual

COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Loan and Project Agreements	Compliance
<p>General</p> <ol style="list-style-type: none"> 1. Borrower will make available, promptly as needed, funds, facilities, services and other resources required, in addition to the loan proceeds for carrying out of the Project. 2. Shanxi Economic Development Company (SEDC) will employ competent and qualified consultants and contractors acceptable to the Asian Development Bank (ADB). 3. SEDC will carry out the Project in accordance with plans, design standards, specification, work schedules, and construction methods acceptable to ADB and furnish these to ADB promptly after their preparation. 4. SEDC will insure the project facilities to such an extent and against such risks and in such amounts consistent with sound practice. 5. SEDC will insure the goods to be imported for the Project and to be financed out of the loan proceeds against hazards incident to the acquisition, transportation, and delivery to the place of use or installation. 6. The Borrower will furnish to ADB reports and information concerning (i) Loan; (ii) goods and services financed out of the loan proceeds; (iii) the Project; (iv) administration, operations, and financial condition relating to the Project. 7. The Borrower shall enable ADB to inspect the Project, the goods financed out of the proceeds of the Loan, and relevant records and documents. 8. SEDC provide ADB with quarterly reports on the carrying out of the Project and on the operation and management of the project facilities. They will be submitted in form and detail and within time periods reasonably requested by ADB, and include progress made and problems encountered during the quarter under review, steps taken or proposed to be 	<p>Loan Agreement, Section 4.02 and PA, Section 2.02</p> <p>Project Agreement, Section 2.03 (a)</p> <p>Project Agreement, 2.04</p> <p>Project Agreement Section 2.05(a)</p> <p>Project Agreement, Section 2.05(b)</p> <p>Loan Agreement, Section 4.04 and Project Agreement, Section 2.08(a)</p> <p>Loan Agreement, Section 4.05 and Project Agreement, Section 2.10</p> <p>Project Agreement, Section 2.08 (b)</p>	<p>Complied with.</p> <p>Complied with. Consultants for project implementation, dam monitoring, and resettlement monitoring were mobilized.</p> <p>Complied with. Design of the Project was approved by the State Planning Commission and furnished to ADB during loan processing.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Complied with.</p> <p>Delayed compliance. First project implementation report as of November 1999 was received May 2000 and second report was received on 6 November 2000. The</p>

ADB= Asian Development Bank, SEDC= Shanxi Economic Development Company

Covenant	Reference in Loan and Project Agreements	Compliance
<p>taken to remedy these problems, and proposed programs of activities and expected progress during the following quarter.</p>		<p>subsequent implementation reports were received with delays.</p>
<p>9. After physical completion of the Project, but not later than 3 months thereafter or such later date as ADB may agree, SEDC will prepare and provide ADB with a report on the execution and operation of the Project, including cost, performance of SEDC of its obligations, and the accomplishment of the purposes of the loan.</p>	<p>Project Agreement, Section 2.08(c)</p>	<p>SEDC submitted its project completion report on 3 June 2004.</p>
<p>10. SEDC will (i) maintain separate accounts for the Project and its overall operations; (ii) have such accounts and related financial statements audited annually, and (iii) furnish to ADB, not later than six months after the close of the fiscal year, certified copies of such audited accounts and financial statements, and auditors' report, all in English. The Wenzhou Municipal Government (WMG) and SEDC will provide ADB with other information concerning accounts, financial statements, and the audit, as ADB may reasonably request from time to time .</p>	<p>Project Agreement, Section 2.09 (a)</p>	<p>Complied with. Audited project accounts/financial statements of FY1999 were received by ADB on 29 June 2000. The subsequent statements were received on time.</p>
<p>11. Wenzhou Municipal Government (WMG) and SEDC will apply the loan proceeds to financing project expenditures in accordance with the provisions of the Loan Agreement and Project Agreement, and will ensure that goods and services financed by the proceeds are used exclusively in the carrying out the Project.</p>	<p>Project Agreement, Section 2.13</p>	<p>Complied with.</p>
<p>Implementation Arrangements</p>		
<p>12. Zhejiang Provincial Government (ZPG) will be the Executing Agency, responsible for overall supervision and coordination of project implementation. WMG will establish a project management office with appropriate staffing.</p>	<p>Loan Agreement, Schedule 6, para. 1</p>	<p>Complied with. A PMO has been established and adequately staffed.</p>
<p>13. SEDC will be the project implementing agency responsible for daily project implementation and coordinating activities required.</p>	<p>Loan Agreement, Schedule 6, para. 2</p>	<p>Complied with.</p>
<p>14. WMG will be the project implementing agency for the resettlement component under the Project, including the conduct of the resettlement through the resettlement office established within WMG.</p>	<p>Loan Agreement, Schedule 6, para. 3</p>	<p>Complied with.</p>

WMG= Wenzhou Municipal Government, ZPG= Zhejiang Provincial Government

Covenant	Reference in Loan and Project Agreements	Compliance
<p>18. ZPG and WMG are to ensure that (i) Wenzhou, Ruian, and Pinyang city governments gradually increase annually from 1 January 2002, the water tariffs charged to water end users to achieve full cost recovery; (ii) water end-user tariffs meet the raw water tariffs and cost of treatment and distribution; (iii) no end users, whether residential, commercial or industrial, institution, or state-owned, are granted exemption from the water tariff or granted a preferential rate; (iv) a system of penalties for delayed payments of the tariff is established and enforced.</p>	<p>Loan Agreement, Schedule 6, para. 7</p>	<p>Largely complied with. Tariffs have been increased considerably since appraisal.</p>
Power Purchase Agreement		
<p>19. The Borrower, ZPG, and WMG will ensure WEPB and SEDC execute and deliver on behalf of the parties to the power purchase agreement commencing 1 January 2002 or such other date when the project facilities start commercial operations.</p>	<p>Loan Agreement, Schedule 6, para 9</p>	<p>Largely complied with. A power purchase agreement was drafted and will be finalized and signed once pending state legislation on power sales is promulgated.</p>
<p>20. The power purchase agreement will be in accordance with the laws of the Borrower and contain terms and conditions acceptable to ADB, to include (i) that Wenzhou Electric Power Bureau (WEPB) will purchase all the power generated from SEDC; and (ii) that WEPB will pay a tariff for the power purchased from SEDC at a rate not less than CNY1.10/kWh in year 2002.</p>	<p>Loan Agreement, Schedule 6, para. 9</p>	<p>Largely complied with. SEDC expects to sell all power. Power tariffs are below appraisal levels but are adequate and will be reviewed annually.</p>
<p>21. ZPG and WMG will ensure that SEDC conducts annual reviews of the power tariffs to meet any changes in operating costs and SEDC's financial performance ratios, and maintain and adjust power tariffs to the level to provide full cost recovery and make necessary submissions to the Price Bureau for approval</p>	<p>Loan Agreement, Schedule 6, para. 10</p>	<p>Complied with.</p>
Financial		
<p>22. The Borrower, ZPG, and WMG will ensure that all local cost financing from SEDC's shareholders is provided to the Project on a timely basis to enable the full and timely completion of the Project.</p>	<p>Loan Agreement, Schedule 6, para. 12</p>	<p>Complied with.</p>
<p>23. SEDC will not repay, prior to agreed maturity, any debt that may result in its financial position being adversely affected by such repayment.</p>	<p>Loan Agreement, Schedule 6, para. 14</p>	<p>Complied with.</p>

WEPB= Wenzhou Electric Power Bureau.

Covenant	Reference in Loan and Project Agreements	Compliance
24. SEDC will not incur any debt unless its estimated net revenues for each fiscal year commencing from fiscal year 2002 during the term of the debt to be incurred will be at least 1.3 times the estimated debt service requirements of SEDC in such year on all debt of SEDC including the debt to be incurred.	Loan Agreement, Schedule 6, para. 15	Not complied with. Short-term loans have been secured and will likely be needed to cover cash flow deficits despite a low debt-service coverage ratio.
25. Unless with ADB's prior approval, SEDC will not incur additional debt, in the fiscal year starting from 1 January 1997, if after incurring such debt the debt-equity ratio will be greater than 70 to 30.	Loan Agreement, Schedule 6, para. 16	Complied with.
26. SEDC will establish and operate a separate bank account called "retention account" and ensure that starting 1 January 2002, the minimum balance in the account will at all times be sufficient to cover six months of O&M expenditures.	Loan Agreement, Schedule 6, para. 17	Largely complied with. Account balances are not yet sufficient.
27. SEDC will establish and operate a second separate bank account called "debt service account" and ensure that, starting 15 March 2002, the minimum balance in the account will at all times be sufficient to cover 6 months of debt service obligations under the Loan.	Loan Agreement, Schedule 6, para. 18	Complied with. This is reflected in the guidelines.
28. The cash balances maintained by SEDC over and above those maintained in the retention account and debt service account will be kept as "general cash reserve" to be utilized in the following order: (i) repayment of principal and interests of the loan; (ii) repayment of principal and interest for debts owed to other financial institutions; (iii) allocation to the retention account and debt service account; (iv) payment of shareholders' advance obligations in terms of interest and principal.	Loan Agreement, Schedule 6, para. 19	Largely complied with.
29. SEDC will not declare dividends in any 1 year if any obligation under covenants 26, 27, 28 has not been fulfilled and will not declare dividends that exceed the general cash reserve balances in excess of the amounts maintained in the retention account and debt service account.	Loan Agreement, Schedule 6, para. 20	Complied with.

Covenant	Reference in Loan and Project Agreements	Compliance
<p>Environmental</p>		
<p>30. The Borrower, ZPG, and SEDC will ensure that environmental mitigating measures recommended in the environmental impact assessment are implemented. ADB will be informed and justification provided within 60 days if changes are required to the mitigating measures during design, construction, and O&M,</p>	<p>Loan Agreement, Schedule 6, para, 21</p>	<p>Complied with. Policies and procedures for implementation of environmental protection and rehabilitation were developed.</p>
<p>31. The Borrower, ZPG, and SEDC will ensure that within 1 month of the effective date, a lead team for environment protection and an environment monitoring office are established to monitor the environmental monitoring measures under the environmental monitoring program to be established within 3 months of the effective date. Environmental reports covering the progress made on mitigation measures and monitoring are to be submitted to ADB, annually during project implementation and for 3 years after project completion.</p>	<p>Loan Agreement, Schedule 6, para. 22</p>	<p>Being complied with, but submission of annual environmental reports was delayed. The lead team for environment protection and the environment monitoring office have been established. The Wenzhou Environmental Protection Bureau is undertaking environmental monitoring. The Water Resources Protection Plan was developed and finalized in October 2001.</p>
<p>Resettlement</p>		
<p>32. The Borrower, ZPG, WMG, and SEDC will ensure that the summary resettlement plan (SRP) is carried out promptly and efficiently and all affected persons, as defined in the SRP, have improved or at least maintained the standard of living they enjoyed before the start of the Project, in accordance with laws of the Borrower and policies of ADB.</p>	<p>Loan Agreement, Schedule 6, para. 23</p>	<p>Resettlement has progressed in accordance with the SRP. So far, 36,888 persons have been resettled. Those resettled received compensation in farmland and/or cash.</p>
<p>33. The Borrower, ZPG, and SEDC will ensure funds for resettlement required under the SRP are provided on a timely basis to the WMG Finance Bureau; the Wenzhou Resettlement Office; and the county, district, township, and special resettlement offices set up for the Project</p>	<p>Loan Agreement, Schedule 6, para. 24</p>	<p>Complied with. As of December 2002, total costs for resettlement have reached more that CNY1 billion.</p>

SRP= Summary Resettlement Plan.

Covenant	Reference in Loan and Project Agreements	Compliance
<p>34. WMG will ensure that (i) resettlement funds are provided to those resettled on a timely basis to meet the costs of their entitlements under the SRP; (ii) establishment, by the end of 1997, of a reservoir construction fund with a minimum of CNY10 million and replenishment on a revolving basis; (iii) reservoir maintenance fund of a minimum of CNY400,000 to be established once power and water sales from the project facilities start and to be replenished on a revolving basis as required until persons affected by the Project have been fully resolved to their preproject economic basis in the new locations; and (iv) access to money from the above-mentioned funds will be provided on a timely basis to those resettled entitled to such funds under the terms and conditions in the SRP.</p>	<p>Loan Agreement, Schedule 6, para. 25</p>	<p>Complied with. The special resettlement fund, to be replaced by the reservoir construction fund (renamed to reservoir area maintenance fund) has been established with an initial amount of CNY10 million. A budget of CNY40 million is already allocated to the reservoir maintenance fund. A tariff of CNY0.01 is also allocated to the post resettlement program.</p>
<p>35. WMG and SEDC will ensure that from 1997 until 2003 (i) regular progress reports are provided to ADB by the domestic consultants and independent international monitors on implementation of resettlement as detailed in the SRP; and (ii) from SEDC, annual reports on the progress of the resettlement and those resettled.</p>	<p>Loan Agreement, Schedule 6, para. 26</p>	<p>Complied with. Resettlement and Environmental Coordination Office has submitted nine progress reports on resettlement as of June 2002. Annual reports on progress of the resettlement submitted. The resettlement completion report has been submitted.</p>
Benefit Monitoring and Reporting		
<p>36. SEDC will carry out benefit monitoring to ensure that the works and facilities provided under the Project are controlled, operated, and managed efficiently to maximize the project benefits using a benefit and performance monitoring and evaluation system developed by SEDC following ADB's <i>Guidelines for Benefit Monitoring and Evaluation</i>.</p>	<p>Loan Agreement, Schedule 6, para. 27</p>	<p>Being complied with. This has been prepared but needs improvement.</p>
Zhejiang-Shanxi Water Supply Project (Phase 2)		
<p>37. The Borrower, ZPG, and WMG will ensure that the follow-on Zhejiang-Shanxi Water Supply Project (Phase II) is implemented in a timely basis, with completion not later than 1 January 2002.</p>	<p>Loan Agreement, Schedule 6, para. 11</p>	<p>Partly complied with. Construction of the Wenzhou subproject under Phase II is completed. Completion of Ruian and Pinyang has been delayed until December 2004 with no definite date.</p>

SUMMARY OF CONTRACT AWARDS FINANCED BY THE ASIAN DEVELOPMENT BANK

No.	PCSS No.	Contractor/ Supplier	Mode of Procurement	Contract Amount (\$)	Amount Disbursed (\$)
1	0001	O&K Mining GMBH, GER	ICB	1,025,460	1,025,460
2	0002	Lei Shing Hong Machinery Ltd, HKG	IS	196,000	196,000
3	0003	North Hauler Ltd, PRC	ICB	1,545,514	1,545,514
4	0004	Nanjing Atlas n Copco Machinery, PRC	IS	491,573	491,573
5	0005	Svedala Compaction Equipment, SWE	IS	197,311	197,311
6	0006	Wujin Hydraulic Hoist Factory, PRC	ICB	1,666,969	1,605,683
7	0007	Glacier GMBH-Deva Werke, GER	IS	398,200	398,200
8	0008	Shenzhen Topkin Industrial Co., PRC	ICB	1,332,606	1,208,513
9	0009	Kvaerner (Hangzhou) Power Equipment, PRC	ICB	9,381,308	9,381,308
10	0010	Funchunjiang Fuji Electrical Power, PRC	ICB	2,966,115	2,966,115
11	0011	ABB Transmissiibon & Distribution Ltd, HKG	ICB	1,135,708	1,135,708
12	0012	China National Heavy Machinery Co., PRC	ICB	721,068	721,068
13	0013	Shenzhen Topkin Industrial Co., PRC	ICB	657,323	657,323
14	0014	Shenzhen Topkin Industrial Co., PRC	ICB	4,727,046	4,727,046
15	0015	Ma Steel International Trade & Economy, PRC	ICB	4,853,141	2,864,029 ¹
16	0016	Hecec Australia Pty Ltd., AUS	ICB	483,381	482,907
17	0017	Geo-eng International Pty Ltd, AUS	ICB	116,024	85,995
18	0018	Ranji Casinader and Associates, AUS	ICB	66,700	52,267
19	0019	Tod Anthony Ragsdale, USA	ICB	82,735	13,542
20	0020	Matlock Telecom Ltd, HKG	ICB	306,999	291,649
21	0021	Jiangau International Pty Ltd., AUS	ICB	300,000	97,815
Total				32,651,181	30,145,026

AUS = Australia, GER = Germany, HKG = Hongkong, ICB = international competitive bidding, IS = international shopping, PRC = People's Republic of China, SWE = Sweden.

¹ The difference of about \$2.0 million was canceled.

Source: Asian Development Bank.

DEMAND PROJECTS

1. Table A7.1 provides information on water sales to date.

Table A7.1: Water Sales

Year	Annual Sales (1,000 m ³)	Daily Sales (1,000 m ³)
2002	9,000	25
2003	77,000	211

m³ = cubic meter.

Source: Shanxi Economic Development Company.

2. Forecast raw water sales were provided by the Shanxi Economic Development Company. Their near-term forecast is provided in Table A7.2 and the long-term forecast in Table A7.3. The long-term forecast, which was used for the financial projections, is somewhat more conservative than the near-term forecast.

3. The rapid increase between 2003 and 2004 is likely to be only realized in 2005. This growth reflects growing sales in Wenzhou, the connection of Pingyang municipality with the Zhuang Yuan water treatment plant, and an expansion in Tangxia in late 2004.

Table A7.2: Near-Term Forecast of Raw Water Sales
(1,000 m³/day)

Year	Wenzhou	Zhaung Yuan	Ruian	Tang Xia	Ping Yang	Total
2004	450	0	0	30	0	480
2005	450	50	30	50	0	580
2006	450	100	120	50	20	740
2007	450	150	150	50	50	850
2008	450	200	200	50	50	950

m³ = cubic meter .

Source: Data sheet provided by Shanxi Economic Development Company during the Project Completion Review Mission.

Table A7.3: Long-Term Forecast of Raw Water Sales

Year	Annual Sale (1,000 m ³)	Daily Sale (1,000 m ³)
2005	201,000	551
2010	330,000	904
2015	400,000	1,096
2020	400,000	1,096
2025	450,000	1,233
2030	450,000	1,233

m³ = cubic meter.

Source: Shanxi Economic Development Company.

FINANCIAL REEVALUATION

A. General

1. The Shanxi Economic Development Company (SEDC) is a limited liability shareholding company, which was incorporated under the Company Law of the People's Republic of China (PRC). SEDC's primary line of business is the development and operation of the Project. Commercial activities include the sale of raw water to the urban water supply companies in Wenzhou, and the sale of hydroelectric power produced at Shanxi and Zoashandu reservoirs. Other activities include the provision of water for irrigation in areas below these reservoirs and the operation of the Shanxi Reservoir for flood control. SEDC's current shareholding structure is shown in Table A8.1.

Table A8.1: Shareholding Structure of the Shanxi Economic Development Company

Shareholder	Share (CNY million)		Total
	Equity	Advances	
Wenzhou Da Jiangnan Development Company	664.90	0.00	664.90
Zhejiang Financial Development Company	228.64	0.00	228.64
Zhejiang Investment Company for Water Conservancy and Hydroelectric Power Construction	110.00	0.00	110.00
Zhejiang Electric Power Development Company	182.07	0.00	182.07
Total	1185.61	0.00	1185.61

Source: Shanxi Economic Development Company.

B. Assumptions for the Financial Projections

1. Commencement of Commercial Operations

2. The financial projections presented in the tables at the end of this appendix were prepared based on raw water sales commencing in November 2002 and power sales commencing in January 2002. SEDC preoperating costs are capitalized in the financial analysis of the Project as preoperating and capital expenditures. Initial power sales in December 2001 are capitalized as construction revenue.

2. Inflation

3. Construction costs to 2003 are actual costs. Domestic inflation for the period 1998 to 2003 is based on the PRC consumer price index. Domestic inflation was forecast at 3.0% for 2004 and 2.7% for 2005 based on forecasts of the Asian Development Bank (ADB).¹ Beyond 2005, domestic inflation of 3.0% was assumed. International inflation was assumed to be 2.4% throughout.

3. Revenues

¹ Source: ADB Mission Office in Beijing.

4. Revenues result from the sale of raw water and power. Actual revenues are used as reported prior to 2004. Thereafter, revenues are estimated based on forecast sales.

a. Raw Water Revenues

5. The quantity of raw water to be sold will increase as water treatment, transmission, and distribution systems in Wenzhou, Ruian, Pingyang, and smaller municipalities are developed and expanded. A water purchase agreement between SEDC and Wenzhou Water Supply Group (WWSG) has been drafted but not yet signed. Negotiations are ongoing with other communities regarding water purchase agreements. The draft agreement stipulates payment for actual volumes delivered to Wenzhou Water Supply Groups Chen Dai Pumping Station. SEDC forecasts of total sales are given in Table A8.2.

Table A8.2: Forecast Raw Water Sales

Year	Yearly Sale (million m ³)	Daily Sale (1,000 m ³)
2005	201	550
2010	330	904
2015	400	1,095
2020	400	1,095
2025	450	1,232
2030	450	1,232

m³ = cubic meter.

Source: Shanxi Economic Development Company.

6. The water purchase agreement acknowledges a raw water tariff, in 2004 price levels, of CNY0.45/m³, as determined by the Wenzhou Planning and Development Commission.² The commission's Price Bureau is the lead agency in setting the raw water tariff, and will be responsible for future tariff adjustments. SEDC officials asserted that the tariff will gradually increase over time. For purposes of the analysis documented here, the raw water tariff increases are assumed to be at the rate of domestic inflation unless the rate of return to fixed assets exceeds 8% in which case it does not change.

b. Power Sales

7. Sales of power commenced late in 2000 as a result of the need to test generators as they were being commissioned. Sales from 2001 and 2002 were 10.8 and 85.0 million kilowatt-hours (kWh) respectively. Power sales are used to help meet daily peak loads.

8. The power tariff at appraisal was assumed to be CNY1.1/kWh. The tariff currently being charged is CNY0.56 /kWh. Power purchase agreements for the two dams have been drafted but finalization and signing are awaiting the pending release of new national legislation applying to power sale agreements. These tariffs are used for the present analysis. Beyond 2004, the power tariff is adjusted in line with domestic inflation unless the rate of return to fixed assets exceeds 8%, in which case it does not change. Generators at Shanxi and Zoashandu reservoirs have been operated at virtually full capacity since full commercial power production began and this is assumed to continue.

c. Irrigation Water

9. Distribution of irrigation water commenced in 2003. As government policy, irrigation water is provided free of charge.

4. Cost of Sales

10. Cost of sales includes (i) cost of materials, (ii) direct salaries and wages, (iii) direct depreciation, (iv) raw water purchases, and (v) operating overheads.

5. Cost of Materials

11. Material costs per unit of production were provided by SEDC and are assumed to increase in line with inflation. Unit costs are as follows:

Raw water production	CNY0.030/m ³
Raw water conveyance	CNY0.005/m ³
Power	CNY0.025/kwh

6. Salaries and Wages

12. Salaries and wages were computed on the basis of SEDC's staffing, which provides for 197 full-time employees. Salaries and wages were computed on the basis of 2004 salary levels with allowance for inflation. Salaries and wages are based on an estimated average annual wage cost in 2004 of CNY48,500 per employee.

7. Direct Depreciation

13. Fixed assets are depreciated at 3.33% per annum on a declining balance basis.³

8. Direct Operating Overheads

14. Direct operating overhead includes expenses for maintenance and repairs of the civil works and machinery and equipment. These costs were estimated as 0.2% of total sales revenue.

9. Indirect Overhead Expenses and Taxes

15. Indirect overhead costs include administrative overheads. These are estimated as 10% of the cost of sales net of depreciation. Income taxes are calculated at a rate of 33% of net revenue. No value-added tax is collected on sales from the Project.

² Notification number 417, August 26, 2003.

³ Depreciation is calculated on a straight-line basis in the PRC, but for purposes of financial modeling, composite depreciation calculated on a declining balance basis provides a better approximation to depreciation values generated based on straight-line depreciation of individual assets having different life spans.

10. Major Repairs

16. Major repairs were estimated as 10% of the value of the mechanical and electrical investment component in 2006 and 40% of this component every 5 years thereafter beginning in 2016. These amounts are adjusted to reflect local inflation.

11. Balance Sheet Assumptions

17. The assumptions are the following:

- (i) Accounts receivable represent 1 month total sales. An inventory balance of approximately two months of materials and supplies will be maintained.
- (ii) Accounts payable includes 2 months of materials and overhead charges and one full year of the water resource, power resource, and reservoir management fees.
- (iii) Unpaid taxes include 1 month's education surcharge and construction tax, and the previous year's income tax expense.
- (iv) Long-term debt includes ADB's \$36 million loan and four local bank loans of \$2,419 million, all inclusive of capitalized interest during construction. ADB funds are provided with a grace period of 4.5 years plus a 20-year repayment period, which began in 2002. The assumed interest charge over the period of the ADB loan is 6.53%. The local bank loans have a composite interest rate of 5.73% and a repayment period of 11 years. The interest charge on short-term loans is 5.3%.
- (v) A separate bank account, the retention account, was established. The assumed minimum balance represents 6 months debt service payments (interest and principal) and 6 months operation and maintenance expenditures.
- (vi) After-tax profit is allocated as follows: (i) 10% will be allocated to the legal surplus reserve, (ii) 10% will be allocated to the staff welfare reserve, and (iii) 50 % will be paid out as dividends provided that after-tax income is positive and sufficient funds remain to satisfy retention account requirements.
- (vii) Half of the beginning balance of the Staff Welfare Fund will be expended on staff welfare projects each year.

12. Deficit Finance

18. Short-term loans are used to finance annual deficits. These are assumed to have a 1-year term, and are repaid in full the following year. There are no government subsidies.

C. Financial Performance

19. Pro forma statements have been prepared for 2002 to 2031 based on the assumptions outlined earlier. They appear at the end of this appendix, and include the statement of profit and loss, cash flow, and the balance sheet.

1. Financial Internal Rate of Return (FIRR)

20. The project cost estimates and financial projections in nominal terms were converted to real terms by removing the effects of foreign and domestic inflation. The basic assumptions are the same as those used at appraisal and provided earlier. Costs, the financing plan, sales volumes, and revenues have been revised to reflect existing conditions.

21. The FIRR for the Project was calculated over a 35-year period on an after-tax basis. The period of analysis includes a 5-year period for construction. In determining the FIRR, a residual value equal to the net value of fixed assets (i.e., total investment cost less accumulated depreciation) was used. The base case FIRR was determined to be 5.2%. Cash flow data for the calculation are provided in Table A8.3. The FIRR exceeds weighted average cost of capital by a comfortable margin.

Table A8.3: FIRR Calculation
(\$ '000 at 2000 prices)

Year	Capital Investments and Replacements	Project Sales Revenues	Total Non-Capital Costs	Net Annual Value
1997	0	0	0	0
1998	(234,164)	0	0	(234,164)
1999	(1,199,944)	0	0	(1,199,944)
2000	(1,071,795)	0	0	(1,071,795)
2001	(938,050)	0	0	(938,050)
2002	(95,706)	213,247	(8,951)	108,590
2003	0	262,052	(34,601)	227,452
2004	0	295,611	(38,040)	257,570
2005	0	324,692	(45,436)	279,257
2006	(43,828)	338,068	(60,280)	233,960
2007	0	350,140	(69,673)	280,467
2008	0	362,214	(78,855)	283,359
2009	0	374,285	(88,820)	285,464
2010	0	386,358	(98,867)	287,491
2011	(175,313)	393,356	(108,589)	109,454
2012	0	399,908	(114,667)	285,241
2013	0	406,458	(119,809)	286,649
2014	0	401,941	(125,929)	276,011
2015	0	396,424	(129,747)	266,677
2016	(175,313)	385,379	(129,754)	80,312
2017	0	374,154	(125,097)	249,057
2018	0	363,256	(122,470)	240,786
2019	0	352,676	(119,927)	232,749
2020	0	342,404	(117,469)	224,935
2021	(175,313)	335,825	(115,431)	45,082
2022	0	329,639	(112,820)	216,819
2023	0	323,528	(111,960)	211,568
2024	0	317,493	(110,938)	206,555

Year	Capital Investments and Replacements	Project Sales Revenues	Total Non-Capital Costs	Net Annual Value
2025	0	311,536	(109,921)	201,615
2026	(175,313)	302,728	(108,569)	18,846
2027	0	293,911	(104,306)	189,605
2028	0	285,351	(102,051)	183,300
2029	0	277,039	(99,860)	177,179
2030	0	268,970	(97,729)	171,241
2031	(175,313)	261,136	(95,663)	(9,840)
Residual	1,830,083			1,830,083

Source: Staff Estimates.

2. Weighted Average Cost of Capital

22. The weighted average cost of capital was calculated in real terms to be 2.9% (Table A8.4). The cost of foreign debt was calculated based on a nominal interest rate of 6.53%, an income tax rate of 33%, and an international inflation rate of 2.4% per annum. The cost of foreign capital in real terms was computed to be 4.4%. The cost of local debt was calculated based on a nominal interest rate of 5.73%, an income tax rate of 33%, and a local inflation rate of 3% per annum. The cost of local capital in real terms was computed to be 3.8%. The opportunity cost of equity was assumed to equal 8% per annum:

Table A8.4: Weighted Average Cost of Capital Calculation

Funding Source	Real Interest Cost	Amount of Loan	Weight	Weighted Percent
ADB Loan	2.7%	36.0	8%	0.2%
Local Loan	1.8%	258.4	59%	1.0%
Shareholder Equity	4.9%	142.8	33%	1.6%
Total		437.3		2.9%

ADB = Asian Development Bank.

Source: Shanxi Economic Development Company.

3. Financial Viability

23. Financial viability depends on more than the estimated internal rate of return. Key financial performance ratios were estimated for the period of commercial operations using the pro forma financial statements to provide better insight into the viability of SEDC.

24. The average return to equity and fixed assets are both 8.7%. Net income is low in early years of the forecast but is negative only once in 2003. Debt service coverage⁴ averages 6.9 but is less than 1.3 for 12 years up to 2013 during the period of lower net revenues. The debt service coverage ratio exceeds the mandated covenant value of 1.3 from 2014 onward. The current ratio⁵ reveals the same financial weakness in early years as the other ratios. It should exceed 1.0 by a reasonable margin but is less than 0.3 from 2002 to 2013. Thereafter it is never less than 2.0.

⁴ Estimated as (net cash flow from operations)/(debt service payments)

⁵ Current assets/current liabilities

25. Loan covenants require that the ratio of debt to equity never exceed 70:30 or 2.33. This requirement is met throughout the forecast period due to the large injection of share capital by SEDC shareholders.

26. In the long run, SEDC appears to be a very good investment but it will face short-term difficulty in achieving a healthy financial profile. In the pro forma analysis, its survival prior to 2014 when local bank loans are paid off depends entirely on its ability to secure short-term financing, but making short-term loans during this period violates the loan covenants. Government subsidies are an alternative financial coping mechanism that would not violate the covenants.

4. Sensitivity Analysis

27. The sensitivity analysis focused on tariffs and volumes, the principal sources of uncertainty in the financial analysis. Increases in costs were also tested to evaluate the implication of errors in cost assumptions. The following pessimistic scenarios were considered to evaluate financial risk:

- (i) Increases in water and power tariffs are reduced by 50% (i.e., tariffs increase at 90% of the rate of inflation rather than the full rate).
- (ii) Raw water sales are reduced by 10% to 90% of the base case demand levels.
- (iii) The general increase in costs is 10%.

27. In all three scenarios, the switching value at which the FIRR equals the weighted average cost of capital is determined. A supplementary tariff analysis was also completed to consider the implications of setting a higher tariff at the outset followed by lower subsequent increases. This was done to determine the level of tariff that would overcome the financial weakness in the first decade of operations.

28. Overall, the sensitivity analysis suggests that the project finances are not sensitive to variations in underlying assumptions (Table A8.2). The FIRR still exceeds the weighted average cost of capital when water sales are eliminated or the water and power tariffs are held constant in nominal terms. Operating costs must be multiplied by a factor of 2.5 before the FIRR falls to the level of the weighted average cost of capital. The overall financial performance drops significantly when the water sales are eliminated or the tariffs are flat-lined.

29. In the last scenario, initial tariffs must be increased to 96% of the 2031 tariff levels in the base case to achieve significant improvement in debt service coverage.

30. The stability in financial performance occurs because debt servicing costs, which are fixed, comprise 67% of total cash requirements, and power sales are stable and high from the outset resulting in a relatively stable revenue stream. Financial performance improves significantly only when the large local bank loans are paid down and this component of cost is not affected by changed assumptions in the sensitivity analysis scenarios.

Table A8.5: Sensitivity Analysis

Scenario	After Tax FIRR	Return to Equity (avg)	DSCR <1.3 (years)	Switching Value
Base Case	5.2%	8.7%	12	
Tariff Increases Reduced 50%	4.6%	7.4%	13	FIRR always > WACC*
Water Sales Reduced 10%	5.0%	8.5%	12	FIRR always > WACC**
Costs Up 10%	5.1%	8.7%	12	250%
Higher Initial Tariff***	5.6%	9.0%	6	

avg = average, DSCR = debt-service coverage ratio, FIRR = financial internal rate of return, no. = number, WACC = weighted average cost of capital

.Notes:

* With water and power tariffs held at 2003 values in nominal terms until 2031, the FIRR is 3.8%.

** With no water sales, the FIRR is 3.2%.

*** Water and power tariffs set at CNY0.586/m³ and CNY0.729/kWh respectively and held at those levels in nominal terms until 2031. These levels are 96% of the 2031 tariffs in the base case.

Source: Staff Estimates.

Table A8.6: Projected Income Statement

Item	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales									
Raw Water Sales	4,050	35,066	65,200	96,827	112,533	129,095	146,549	164,933	184,290
Treated Water Sales	0	0	0	0	0	0	0	0	0
Power Sales Revenue	224,000	226,688	233,489	239,793	246,987	254,396	262,028	269,889	277,986
	228,050	261,754	298,689	336,620	359,520	383,491	408,577	434,822	462,276
Cost of Sales									
Material	10,840	13,364	15,775	18,567	20,056	21,677	23,380	25,162	27,032
Direct Labor	6,258	6,702	7,184	7,398	7,599	7,828	8,062	8,306	8,552
Repairs/Maintenance	456	524	597	673	719	767	817	870	925
Depreciation	59,658	118,888	118,888	118,888	120,433	120,433	120,433	120,433	120,433
Resources Fees	8,180	9,540	10,780	12,020	12,536	13,052	13,568	14,084	14,600
	85,392	149,017	153,225	157,546	161,343	163,757	166,260	168,854	171,542
Gross Margin	142,658	112,737	145,464	179,073	198,176	219,735	242,317	265,968	290,734
Operating Costs									
Administrative Salaries	1,723	1,847	1,979	2,038	2,093	2,156	2,220	2,287	2,356
Depreciation	0	0	0	0	0	0	0	0	0
Administration Costs	2,573	3,013	3,434	3,866	4,091	4,332	4,583	4,842	5,111
	4,296	4,860	5,413	5,904	6,184	6,489	6,803	7,129	7,467
Operating Income	138,361	107,877	140,052	173,170	191,992	213,246	235,514	258,838	283,267
Less	138,361	107,877	140,052	173,170	191,992	213,246	235,514	258,838	283,267
Interest Expense - Foreign	18,438	18,744	18,193	17,606	16,981	16,314	15,605	14,849	14,043
Interest Expense - Local Bank	117,431	110,095	101,045	91,476	81,359	70,662	59,354	47,397	34,756
Interest Expense – Short Term Loan	0	5,255	9,032	11,253	12,047	15,034	15,176	14,749	13,755
Income Tax	823	0	3,888	17,436	26,930	36,708	47,975	60,008	72,835
Net Income	1,670	(26,217)	7,894	35,399	54,675	74,527	97,404	121,835	147,877
Retained Earnings, Beginning	0	1,336	(24,882)	(18,566)	9,754	53,494	113,116	191,040	288,507
Allocations:									
Legal Surplus Fund	167	0	789	3,540	5,467	7,453	9,740	12,184	14,788
Staff Welfare Fund	167	0	789	3,540	5,467	7,453	9,740	12,184	14,788
Dividends	0	0	0	0	0	0	0	0	0
Retained Earnings, Ending	1,336	(24,882)	(18,566)	9,754	53,494	113,116	191,040	288,507	406,809
Gross Margin as a % Net Sales	62.6%	43.1%	48.7%	53.2%	55.1%	57.3%	59.3%	61.2%	62.9%
Operating Margin % Net Sales	60.7%	41.2%	46.9%	51.4%	53.4%	55.6%	57.6%	59.5%	61.3%
Ave Fixed Assets to Sales	6.4%	7.5%	8.8%	10.3%	11.3%	12.5%	13.8%	15.3%	17.0%
After-Tax Return on Average Fixed Assets	0.1%	-0.8%	0.2%	1.1%	1.7%	2.4%	3.3%	4.3%	5.5%
After-Tax Return on Average Equity	0.1%	-2.2%	0.7%	3.0%	4.5%	5.9%	7.5%	9.0%	10.4%

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Table A8.6 – Continued

Item	2011	2012	2013	2014	2015	2016	2017	2018
Sales								
Raw Water Sales	197,871	212,102	227,008	235,551	244,095	244,095	244,095	244,095
Treated Water Sales	0	0	0	0	0	0	0	0
Power Sales Revenue	286,325	294,915	303,762	303,762	303,762	303,762	303,762	303,762
	484,196	507,017	530,770	539,313	547,857	547,857	547,857	547,857
Cost of Sales								
Material	28,469	29,961	31,522	33,146	34,841	35,884	36,963	38,075
Direct Labor	8,811	9,074	9,346	9,629	9,916	10,215	10,520	10,836
Repairs/Maintenance	968	1,014	1,062	1,079	1,096	1,096	1,096	1,096
Depreciation	127,599	127,599	127,599	127,599	127,599	135,907	135,907	135,907
Resources Fees	14,880	15,160	15,440	15,720	16,000	16,000	16,000	16,000
	180,727	182,808	184,969	187,172	189,452	199,102	200,486	201,914
Gross Margin	303,469	324,208	345,802	352,141	358,406	348,756	347,371	345,943
Operating Costs								
Administrative Salaries	2,426	2,499	2,573	2,651	2,731	2,813	2,898	2,984
Depreciation	0	0	0	0	0	0	0	0
Administration Costs	5,313	5,521	5,737	5,957	6,185	6,319	6,458	6,601
	7,739	8,020	8,310	8,609	8,917	9,132	9,356	9,585
Operating Income	295,730	316,188	337,491	343,532	349,489	339,623	338,015	336,359
Less	295,730	316,188	337,491	343,532	349,489	339,623	338,015	336,359
Interest Expense - Foreign	13,185	12,271	11,297	10,260	9,155	7,978	6,724	5,388
Interest Expense - Local Bank	21,392	7,262	0	0	0	0	0	0
Interest Expense – Short Term Loan	12,156	21,607	19,670	3,235	0	0	0	0
Income Tax	82,169	90,766	101,153	108,912	112,310	109,443	109,326	109,220
Net Income	166,828	184,282	205,371	221,126	228,024	222,202	221,965	221,751
Retained Earnings, Beginning	406,809	540,270	687,697	851,994	1,028,894	1,097,302	1,163,963	1,230,552
Allocations:								
Legal Surplus Fund	16,683	18,428	20,537	22,113	22,802	22,220	22,197	22,175
Staff Welfare Fund	16,683	18,428	20,537	22,113	22,802	22,220	22,197	22,175
Dividends	0	0	0	0	114,012	111,101	110,983	110,875
Retained Earnings, Ending	540,270	687,697	851,994	1,028,894	1,097,302	1,163,963	1,230,552	1,297,077
Gross Margin % Sales	62.7%	63.9%	65.2%	65.3%	65.4%	63.7%	63.4%	63.1%
Operating Margin % Sales	61.1%	62.4%	63.6%	63.7%	63.8%	62.0%	61.7%	61.4%
Ave Fixed Assets to Sales	18.0%	18.9%	20.8%	22.3%	23.9%	24.0%	24.1%	25.6%
After Tax Return on Average Fixed Assets	6.2%	6.9%	8.1%	9.1%	9.9%	9.7%	9.8%	10.4%
After Tax Return on Average Equity	11.1%	11.6%	12.2%	12.4%	12.4%	11.8%	11.6%	11.3%

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Table A8.6 – Continued

Item	2019	2020	2021	2022	2023	2024	2025
Sales							
Raw Water Sales	244,095	244,095	250,197	256,300	262,402	268,504	274,607
Treated Water Sales	0	0	0	0	0	0	0
Power Sales Revenue	303,762	303,762	303,762	303,762	303,762	303,762	303,762
	547,857	547,857	553,959	560,062	566,164	572,266	578,369
Cost of Sales							
Material	39,216	40,393	42,200	44,084	46,038	48,071	50,186
Direct Labor	11,161	11,495	11,839	12,193	12,561	12,937	13,326
Repairs/Maintenance	1,096	1,096	1,108	1,120	1,132	1,145	1,157
Depreciation	135,907	135,907	145,538	145,538	145,538	145,538	145,538
Resources Fees	16,000	16,000	16,200	16,400	16,600	16,800	17,000
	203,379	204,890	216,885	219,335	221,869	224,491	227,207
Gross Margin	344,478	342,967	337,074	340,727	344,295	347,776	351,163
Operating Costs							
Administrative Salaries	3,075	3,167	3,260	3,359	3,460	3,563	3,670
Depreciation	0	0	0	0	0	0	0
Administration Costs	6,747	6,898	7,135	7,380	7,633	7,895	8,167
	9,822	10,065	10,394	10,738	11,093	11,458	11,837
Operating Income	334,656	332,902	326,680	329,989	333,203	336,318	339,326
Less	334,656	332,902	326,680	329,989	333,203	336,318	339,326
Interest Expense - Foreign	3,964	2,448	833	0	0	0	0
Interest Expense - Local Bank	0	0	0	0	0	0	0
Interest Expense – Short Term Loan	0	0	0	0	0	0	0
Income Tax	109,128	109,050	107,530	108,896	109,957	110,985	111,978
Net Income	221,564	221,404	218,317	221,093	223,246	225,333	227,348
Retained Earnings, Beginning	1,297,077	1,363,547	1,429,969	1,495,463	1,561,792	1,628,765	1,696,365
Allocations:							
Legal Surplus Fund	22,156	22,140	21,832	22,109	22,325	22,533	22,735
Staff Welfare Fund	22,156	22,140	21,832	22,109	22,325	22,533	22,735
Dividends	110,782	110,702	109,159	110,546	111,623	112,666	113,674
Retained Earnings, Ending	1,363,547	1,429,969	1,495,463	1,561,792	1,628,765	1,696,365	1,764,569
Gross Margin % Sales	62.9%	62.6%	60.9%	60.8%	60.8%	60.8%	60.7%
Operating Margin % Sales	61.1%	60.8%	59.0%	58.9%	58.9%	58.8%	58.7%
Ave Fixed Assets to Sales	27.3%	29.3%	29.6%	29.9%	32.8%	36.2%	40.3%
After Tax Return on Average Fixed Assets	11.1%	11.9%	11.7%	11.8%	12.9%	14.3%	15.8%
After Tax Return on Average Equity	11.0%	10.8%	10.4%	10.3%	10.2%	10.1%	10.0%

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Table A8.6 – Continued

Item	2026	2027	2028	2029	2030	2031		
Sales								
Raw Water Sales	274,607	274,607	274,607	274,607	274,607	274,607		
Treated Water Sales	0	0	0	0	0	0		
Power Sales Revenue	303,762	303,762	303,762	303,762	303,762	303,762		
	578,369	578,369	578,369	578,369	578,369	578,369		
Cost Of Sales								
Material	51,691	53,244	54,845	56,494	58,186	59,930		
Direct Labor	13,726	14,137	14,561	14,998	15,448	15,910		
Repairs/Maintenance	1,157	1,157	1,157	1,157	1,157	1,157		
Depreciation	156,702	156,702	156,702	156,702	156,702	169,645		
Resources Fees	17,000	17,000	17,000	17,000	17,000	17,000		
	240,276	242,240	244,265	246,350	248,493	263,642		
Gross Margin	338,093	336,130	334,105	332,019	329,877	314,727		
Operating Costs								
Administrative Salaries	3,781	3,894	4,011	4,133	4,255	4,383		
Depreciation	0	0	0	0	0	0		
Administration Costs	8,357	8,554	8,756	8,965	9,179	9,400		
	12,139	12,448	12,768	13,098	13,434	13,783		
Operating Income	325,955	323,682	321,337	318,921	316,442	300,945		
Less	325,955	323,682	321,337	318,921	316,442	300,945		
Interest Expense - Foreign	0	0	0	0	0	0		
Interest Expense - Local Bank	0	0	0	0	0	0		
Interest Expense – Short Term Loan	0	0	0	0	0	0		
Income Tax	107,565	106,815	106,041	105,244	104,426	99,312		
Net Income	218,390	216,867	215,296	213,677	212,016	201,633		
Retained Earnings, Beginning	1,764,569	1,830,086	1,895,145	1,959,733	2,023,836	2,087,440		
Allocations:								
Legal Surplus Fund	21,839	21,687	21,530	21,368	21,202	20,163		
Staff Welfare Fund	21,839	21,687	21,530	21,368	21,202	20,163		
Dividends	109,195	108,433	107,648	106,838	106,008	100,816		
Retained Earnings, Ending	1,830,086	1,895,145	1,959,733	2,023,836	2,087,440	2,147,930		
Gross Margin % Sales	58.5%	58.1%	57.8%	57.4%	57.0%	54.4%	59.9%	43.1%
Operating Margin % Sales	56.4%	56.0%	55.6%	55.1%	54.7%	52.0%	58.1%	41.2%
Ave Fixed Assets to Sales	39.9%	39.6%	44.3%	50.4%	58.3%	56.6%	23.5%	0.0%
After Tax Return on Average Fixed Assets	15.1%	14.8%	16.5%	18.6%	21.4%	19.7%	8.4%	-0.8%
After Tax Return on Average Equity	9.4%	9.2%	8.9%	8.7%	8.5%	8.0%	6.6%	-2.2%

Source: Staff Estimates.

Table A8.7: Projected Cash Flow Statement

Item	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cash Inflows:									
From sales	209,046	258,945	295,611	333,459	357,612	381,493	406,487	432,635	459,988
Drawdown of Local Bank Loan	42,793	0	0	0	0	0	0	0	0
Drawdown of ADB Loan	25,215	0	0	0	0	0	0	0	0
Short Term Loan	99,149	170,408	212,317	227,309	283,669	286,345	278,279	259,532	229,361
Shareholder Capital	25,615	0	0	0	0	0	0	0	0
	401,818	429,353	507,928	560,768	641,281	667,838	684,766	692,167	689,349
Cash Outflows:									
Operating Expenses	19,314	33,367	38,040	42,774	46,328	48,982	51,785	54,692	57,700
Investments	93,623	0	0	0	0	0	0	0	0
Major Repairs and Replacements	0	0	0	0	46,362	0	0	0	0
Loan Repayments—ADB	7,671	8,172	8,706	9,274	9,880	10,525	11,212	11,944	12,724
Loan Repayments—Local Bank	145,341	153,664	162,462	171,765	181,600	191,999	202,993	214,617	226,906
Loan Repayments—Short Term Loan	0	99,149	170,408	212,317	227,309	283,669	286,345	278,279	259,532
Interest Payments—ADB	18,438	18,744	18,193	17,606	16,981	16,314	15,605	14,849	14,043
Interest Payments—Local Bank	117,431	110,095	101,045	91,476	81,359	70,662	59,354	47,397	34,756
Interest Payments—Short Term Loan	0	5,255	9,032	11,253	12,047	15,034	15,176	14,749	13,755
Tax Payments	0	823	0	3,888	17,436	26,930	36,708	47,975	60,008
Dividend Payments	0	0	0	0	0	0	0	0	0
Staff Welfare Payments	0	84	42	415	1,978	3,722	5,588	7,664	9,924
	401,818	429,353	507,928	560,768	641,281	667,838	684,766	692,167	689,349
Cash Flow Surplus (deficit)	0	0	0	0	0	0	0	0	0
Cash Balance Beginning	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Cash Balance Ending	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Cash in Retention Account	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
General Cash Account	0	0	0	0	0	0	0	0	0
Total Cash	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Debt Service Coverage Ratio	0.66	0.57	0.55	0.57	0.59	0.57	0.60	0.65	0.72

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Table A8.7 – Continued

Item	2011	2012	2013	2014	2015	2016	2017	2018
Cash Inflows:								
From Sales	482,369	505,116	528,790	538,601	547,145	547,857	547,857	547,857
Drawdown of Local Bank Loan	0	0	0	0	0	0	0	0
Drawdown of ADB Loan	0	0	0	0	0	0	0	0
Short Term Loan	407,680	371,132	61,034	0	0	0	0	0
Shareholder Capital	0	0	0	0	0	0	0	0
	890,049	876,248	589,824	538,601	547,145	547,857	547,857	547,857
Cash Outflows:								
Operating Expenses	60,326	62,664	65,102	67,592	70,166	72,149	73,731	75,382
Investments	0	0	0	0	0	0	0	0
Major Repairs and Replacements	214,985	0	0	0	0	249,226	0	0
Loan Repayments—ADB	13,555	14,440	15,383	16,388	17,458	18,598	19,812	21,106
Loan Repayments—Local Bank	239,898	253,635	0	0	0	0	0	0
Loan Repayments—Short Term Loan	229,361	407,680	371,132	61,034	0	0	0	0
Interest Payments—ADB	13,185	12,271	11,297	10,260	9,155	7,978	6,724	5,388
Interest Payments—Local Bank	21,392	7,262	0	0	0	0	0	0
Interest Payments—Short Term Loan	12,156	21,607	19,670	3,235	0	0	0	0
Tax Payments	72,835	82,169	90,766	101,153	108,912	112,310	109,443	109,326
Dividend Payments	0	0	0	0	0	114,012	111,101	110,983
Staff Welfare Payments	12,356	14,519	16,474	18,505	20,309	21,556	21,888	22,042
	890,049	876,248	589,824	278,167	226,000	595,829	342,700	344,227
Cash Flow Surplus (deficit)	0	0	0	260,435	321,146	(47,972)	205,158	203,631
Cash Balance Beginning	3,000	3,000	3,000	3,000	263,435	584,580	536,608	741,766
Cash Balance Ending	3,000	3,000	3,000	263,435	584,580	536,608	741,766	945,397
Cash in Retention Account	3,000	3,000	3,000	3,000	48,389	49,362	50,134	50,938
General Cash Account	0	0	0	260,435	536,191	487,246	691,633	894,459
Total Cash	3,000	3,000	3,000	263,435	584,580	536,608	741,766	945,397
Debt Service Coverage Ratio	0.80	0.62	1.11	5.18	17.92	17.90	17.87	17.83

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Table A8.7 – Continued

Item	2019	2020	2021	2022	2023	2024	2025
Cash Inflows:							
From Sales	547,857	547,857	553,451	559,553	565,656	571,757	577,861
Drawdown of Local Bank Loan	0	0	0	0	0	0	0
Drawdown of ADB Loan	0	0	0	0	0	0	0
Short Term Loan	0	0	0	0	0	0	0
Shareholder Capital	0	0	0	0	0	0	0
	547,857	547,857	553,451	559,553	565,656	571,757	577,861
Cash Outflows:							
Operating Expenses	77,079	78,827	81,184	83,979	86,855	89,826	92,906
Investments	0	0	0	0	0	0	0
Major Repairs and Replacements	0	0	288,922	0	0	0	0
Loan Repayments—ADB	22,484	23,953	25,517	0	0	0	0
Loan Repayments—Local Bank	0	0	0	0	0	0	0
Loan Repayments—Short Term Loan	0	0	0	0	0	0	0
Interest Payments—ADB	3,964	2,448	833	0	0	0	0
Interest Payments—Local Bank	0	0	0	0	0	0	0
Interest Payments—Short Term Loan	0	0	0	0	0	0	0
Tax Payments	109,220	109,128	109,050	107,530	108,896	109,957	110,985
Dividend Payments	110,875	110,782	110,702	109,159	110,546	111,623	112,666
Staff Welfare Payments	22,109	22,132	22,136	21,984	22,047	22,186	22,359
	345,731	347,269	638,343	322,651	328,344	333,592	338,916
Cash Flow Surplus (deficit)	202,126	200,588	-84,891	236,902	237,312	238,166	238,945
Cash Balance Beginning	945,397	1,147,523	1,348,111	1,263,220	1,500,122	1,737,434	1,975,599
Cash Balance Ending	1,147,523	1,348,111	1,263,220	1,500,122	1,737,434	1,975,599	2,214,545
Cash in Retention Account	51,764	52,614	0	0	0	0	0
General Cash Account	1,095,759	1,295,497	1,263,220	1,500,122	1,737,434	1,975,599	2,214,545
Total Cash	1,147,523	1,348,111	1,263,220	1,500,122	1,737,434	1,975,599	2,214,545
Debt Service Coverage Ratio	17.80	17.77	17.92				

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Table A8.7 – Continued

Item	2026	2027	2028	2029	2030	2031
Cash Inflows:						
From Sales	578,369	578,369	578,369	578,369	578,369	578,369
Drawdown of Local Bank Loan	0	0	0	0	0	0
Drawdown of ADB Loan	0	0	0	0	0	0
Short Term Loan	0	0	0	0	0	43,171
Shareholder Capital	0	0	0	0	0	0
	578,369	578,369	578,369	578,369	578,369	621,540
Cash Outflows:						
Operating Expenses	95,446	97,693	100,029	102,435	104,905	107,451
Investments	0	0	0	0	0	0
Major Repairs and Replacements	334,939	0	0	0	0	388,286
Loan Repayments—ADB	0	0	0	0	0	0
Loan Repayments—Local Bank	0	0	0	0	0	0
Loan Repayments—Short Term Loan	0	0	0	0	0	0
Interest Payments—ADB	0	0	0	0	0	0
Interest Payments—Local Bank	0	0	0	0	0	0
Interest Payments—Short Term Loan	0	0	0	0	0	0
Tax Payments	111,978	107,565	106,815	106,041	105,244	104,426
Dividend Payments	113,674	109,195	108,433	107,648	106,838	106,008
Staff Welfare Payments	22,547	22,193	21,940	21,735	21,552	21,377
	678,585	336,645	337,217	337,859	338,539	727,548
Cash Flow Surplus (deficit)	(100,215)	241,724	241,152	240,510	239,830	(106,008)
Cash Balance Beginning	2,214,545	2,114,329	2,356,053	2,597,205	2,837,716	3,077,546
Cash Balance Ending	2,114,329	2,356,053	2,597,205	2,837,716	3,077,546	2,971,538
Cash in Retention Account	0	0	0	0	0	0
General Cash Account	2,114,329	2,356,053	2,597,205	2,837,716	3,077,546	2,971,538
Total Cash	2,114,329	2,356,053	2,597,205	2,837,716	3,077,546	2,971,538

Debt Service Coverage Ratio

Avg 6.91 Min 0.55

Avg = average, min = minimum

Source: Staff Estimates.

Table A8.8: Projected Balance Sheet

Item	2002	2003	2004	2005	2006	2007	2008	2009
Current Assets								
General Cash	0	0	0	0	0	0	0	0
Retention Account	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Accounts Receivable	19,004	21,813	24,891	28,052	29,960	31,958	34,048	36,235
Inventory	1,807	2,227	2,629	3,095	3,343	3,613	3,897	4,194
	23,811	27,040	30,520	34,147	36,303	38,571	40,945	43,429
Long-Term Assets								
Fixed Assets (net)	3,566,636	3,447,748	3,328,861	3,209,973	3,135,901	3,015,468	2,895,035	2,774,602
	3,566,636	3,447,748	3,328,861	3,209,973	3,135,901	3,015,468	2,895,035	2,774,602
Total Assets	3,590,447	3,474,788	3,359,381	3,244,120	3,172,204	3,054,039	2,935,980	2,818,031
Current Liabilities								
Accounts Payable	12,524	14,566	16,677	18,931	19,945	21,045	22,173	23,328
Wages/Welfare Payable	0	0	0	0	0	0	0	0
Unpaid Taxes	823	0	3,888	17,436	26,930	36,708	47,975	60,008
Dividends Payable	0	0	0	0	0	0	0	0
Short-Term loan	99,149	170,408	212,317	227,309	283,669	286,345	278,279	259,532
Current Portion of Long-Term Debt								
Local Bank	153,664	162,462	171,765	181,600	191,999	202,993	214,617	226,906
ADB	8,172	8,706	9,274	9,880	10,525	11,212	11,944	12,724
	274,331	356,142	413,921	455,156	533,068	558,303	574,988	582,498
Shareholder Advances	0	0	0	0	0	0	0	0
Long-Term Liabilities								
Long-Term Loan—Local Bank	1,845,876	1,683,413	1,511,648	1,330,048	1,138,049	935,056	720,439	493,534
Long-Term Loan—ADB	282,961	274,255	264,981	255,101	244,576	233,364	221,420	208,695
	2,128,836	1,957,668	1,776,629	1,585,149	1,382,625	1,168,420	941,859	702,229
Owner's Equity								
Share Capital	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610
Legal Surplus Fund	167	167	956	4,496	9,963	17,416	27,156	39,340
Staff Welfare Fund	167	83	830	3,955	7,444	11,175	15,327	19,847

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Table A8.8 – Continued

Item	2002	2003	2004	2005	2006	2007	2008	2009
Retained earnings	1,336	-24,882	-18,566	9,754	53,494	113,116		
	1,187,280	1,160,978	1,168,830	1,203,815	1,256,511	1,327,317	1,419,133	1,533,304
Total Liabilities and Owner's Equity	3,590,447	3,474,788	3,359,381	3,244,120	3,172,204	3,054,039	2,935,980	2,818,031
Current Ratio	0.09	0.08	0.07	0.08	0.07	0.07	0.07	0.07
Quick Ratio	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Equity/(debt + equity)	0.36	0.37	0.40	0.43	0.48	0.53	0.60	0.69
Retention Acct (months)	0.80	0.60	0.60	0.50	0.50	0.50	0.50	0.40
Debt/Equity	1.79	1.69	1.52	1.32	1.10	0.88	0.66	0.46
Item	2010	2011	2012	2013	2014	2015	2016	2017
Current Assets								
General Cash	0	0	0	0	260,435	536,191	487,246	691,633
Retention Account	3,000	3,000	3,000	3,000	3,000	48,389	49,362	50,134
Accounts Receivable	38,523	40,350	42,251	44,231	44,943	45,655	45,655	45,655
Inventory	4,505	4,745	4,994	5,254	5,524	5,807	5,981	6,161
	46,028	48,095	50,245	52,485	313,902	636,042	588,244	793,582
Long-Term Assets								
Fixed Assets (Net)	2,654,168	2,741,554	2,613,954	2,486,355	2,358,755	2,231,156	2,344,475	2,208,568
	2,654,168	2,741,554	2,613,954	2,486,355	2,358,755	2,231,156	2,344,475	2,208,568
Total Assets	2,700,196	2,789,649	2,664,199	2,538,840	2,672,657	2,867,198	2,932,720	3,002,150
Current Liabilities								
Accounts Payable	24,514	25,295	26,109	26,947	27,806	28,692	29,044	29,428
Wages/Welfare Payable	0	0	0	0	0	0	0	0
Unpaid Taxes	72,835	82,169	90,766	101,153	108,912	112,310	109,443	109,326
Dividends Payable	0	0	0	0	0	114,012	111,101	110,983
Short-Term Loan	229,361	407,680	371,132	61,034	0	0	0	0
Current Portion of Long-Term Debt								
Local Bank	239,898	253,635	0	0	0	0	0	0
ADB	13,555	14,440	15,383	16,388	17,458	18,598	19,812	21,106
	580,164	783,220	503,390	205,521	154,176	273,612	269,401	270,843
Shareholder Advances	0	0	0	0	0	0	0	0
Long-Term Liabilities								
Long-Term Loan—Local Bank	253,635	0	0	0	0	0	0	0
Long-Term Loan—ADB	195,140	180,700	165,316	148,928	131,470	112,872	93,060	71,954
	448,775	180,700	165,316	148,928	131,470	112,872	93,060	71,954

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Table A8.8 – Continued

Item	2010	2011	2012	2013	2014	2015	2016	2017
Owner's Equity								
Share Capital	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610
Legal Surplus Fund	54,128	70,811	89,239	109,776	131,889	154,691	176,911	199,108
Staff Welfare Fund	24,711	29,038	32,947	37,010	40,618	43,111	43,775	44,084
Retained Earnings	406,809	540,270	687,697	851,994	1,028,894	1,097,302	1,163,963	1,230,552
	1,671,258	1,825,729	1,995,493	2,184,390	2,387,011	2,480,714	2,570,259	2,659,354
Total Liabilities and Owner's Equity	2,700,196	2,789,649	2,664,199	2,538,840	2,672,657	2,867,198	2,932,720	3,002,150
Current Ratio	0.08	0.06	0.10	0.26	2.04	2.32	2.18	2.93
Quick Ratio	0.07	0.05	0.08	0.22	1.98	2.13	1.98	2.72
Equity/(debt + equity)	0.79	0.91	0.92	0.94	0.95	0.96	0.97	0.97
Retention Acct (months)	0.40	0.40	0.40	0.40	0.40	6.00	6.00	6.00
Debt/Equity	0.27	0.10	0.08	0.07	0.06	0.05	0.04	0.03

Item	2018	2019	2020	2021	2022	2023	2024	2025
Current Assets								
General Cash	894,459	1,095,759	1,295,497	1,263,220	1,500,122	1,737,434	1,975,599	2,214,545
Retention Account	50,938	51,764	52,614	0	0	0	0	0
Accounts Receivable	45,655	45,655	45,655	46,163	46,672	47,180	47,689	48,197
Inventory	6,346	6,536	6,732	7,033	7,347	7,673	8,012	8,364
	997,398	1,199,714	1,400,498	1,316,416	1,554,141	1,792,287	2,031,300	2,271,106
Long-Term Assets								
Fixed Assets (Net)	2,072,661	1,936,754	1,800,847	1,944,231	1,798,694	1,653,156	1,507,618	1,362,080
	2,072,661	1,936,754	1,800,847	1,944,231	1,798,694	1,653,156	1,507,618	1,362,080
Total Assets	3,070,059	3,136,468	3,201,345	3,260,647	3,352,834	3,445,442	3,538,918	3,633,186
Current Liabilities								
Accounts Payable	29,823	30,229	30,647	31,506	32,377	33,272	34,196	35,148
Wages/Welfare Payable	0	0	0	0	0	0	0	0
Unpaid Taxes	109,220	109,128	109,050	107,530	108,896	109,957	110,985	111,978
Dividends Payable	110,875	110,782	110,702	109,159	110,546	111,623	112,666	113,674
Short term loan	0	0	0	0	0	0	0	0
Current Portion of Long-Term Debt								
Local Bank	0	0	0	0	0	0	0	0
ADB	22,484	23,953	25,517	0	0	0	0	0
	272,403	274,092	275,916	248,195	251,819	254,852	257,847	260,800
Shareholder Advances	0	0	0	0	0	0	0	0
Long-Term Liabilities								
Long-Term Loan—local bank	0	0	0	0	0	0	0	0

Table A8.8 – Continued

Item	2018	2019	2020	2021	2022	2023	2024	2025
Long-Term Loan—ADB	49,469	25,517	0	0	0	0	0	0
	49,469	25,517	0	0	0	0	0	0
Owner's Equity								
Share Capital	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610
Legal Surplus Fund	221,283	243,439	265,579	287,411	309,520	331,845	354,378	377,113
Staff Welfare Fund	44,217	44,264	44,272	43,968	44,093	44,371	44,718	45,094
Retained Earnings	1,297,077	1,363,547	1,429,969	1,495,463	1,561,792	1,628,765	1,696,365	1,764,569
	2,748,187	2,836,860	2,925,430	3,012,452	3,101,015	3,190,591	3,281,071	3,372,386
Total Liabilities and Owner's Equity	3,070,059	3,136,468	3,201,345	3,260,647	3,352,834	3,445,442	3,538,918	3,633,186
Current Ratio	3.66	4.38	5.08	5.30	6.17	7.03	7.88	8.71
Quick Ratio	3.45	4.16	4.86	5.28	6.14	7.00	7.85	8.68
Equity/(debt + equity)	0.98	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Retention Acct (months)	6.00	6.00						
Debt/Equity	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Item	2026	2027	2028	2029	2030	2031
Current Assets						
General Cash	2,114,329	2,356,053	2,597,205	2,837,716	3,077,546	2,971,538
Retention Account	0	0	0	0	0	0
Accounts Receivable	48,197	48,197	48,197	48,197	48,197	48,197
Inventory	8,615	8,874	9,141	9,416	9,698	9,988
	2,171,141	2,413,124	2,654,543	2,895,329	3,135,441	3,029,723
Long-Term Assets						
Fixed Assets (net)	1,540,317	1,383,615	1,226,913	1,070,210	913,508	1,132,149
	1,540,317	1,383,615	1,226,913	1,070,210	913,508	1,132,149
Total Assets	3,711,459	3,796,739	3,881,456	3,965,539	4,048,949	4,161,872
Current Liabilities						
Accounts Payable	35,665	36,217	36,785	37,371	37,973	38,592
Wages/Welfare Payable	0	0	0	0	0	0
Unpaid Taxes	107,565	106,815	106,041	105,244	104,426	99,312
Dividends Payable	109,195	108,433	107,648	106,838	106,008	100,816
Short-Term loan	0	0	0	0	0	43,171
Current Portion of Long-Term Debt						
Local Bank	0	0	0	0	0	0
ADB	0	0	0	0	0	0
	252,425	251,465	250,474	249,453	248,407	281,891
Shareholder Advances	0	0	0	0	0	0

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Table A8.8 – Continued

Item	2026	2027	2028	2029	2030	2031			
Long-Term Liabilities									
Long-Term Loan—local bank	0	0	0	0	0	0			
Long-Term Loan—ADB	0	0	0	0	0	0			
	0	0	0	0	0	0			
Owner's Equity									
Share Capital	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610	1,185,610			
Legal Surplus Fund	398,952	420,639	442,169	463,537	484,739	504,902			
Staff Welfare Fund	44,386	43,880	43,470	43,103	42,753	41,539			
Retained Earnings	1,830,086	1,895,145	1,959,733	2,023,836	2,087,440	2,147,930			
	3,459,034	3,545,274	3,630,982	3,716,086	3,800,542	3,879,981			
Total Liabilities and Owner's Equity	3,711,459	3,796,739	3,881,456	3,965,539	4,048,949	4,161,872			
							Avg	Min	Max
Current Ratio	8.60	9.60	10.60	11.61	12.62	10.75	3.42	0.02	
Quick Ratio	8.57	9.56	10.56	11.57	12.58	10.71	3.36	0.05	
Equity/(debt + equity)	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.34	
Retention Acct (months)							2.02	0.40	
Debt/Equity	0.00	0.00	0.00	0.00	0.00	0.00	0.42		1.92

Avg = average, Min = minimum, Max = maximum
 Source: Staff Estimates.

ECONOMIC ANALYSIS

A. Introduction

1. An economic analysis was undertaken to determine how changes in cost estimates, the financing plan, and assumed production levels would affect the economic internal rate of return (EIRR). A detailed reassessment of economic performance was not feasible, but an assessment based on the assumptions and approach used during appraisal was possible. The evaluation was carried out for the Project as a whole rather than for its subcomponent benefits since the project costing by subcomponent was not available. The analysis covers a 35-year time frame including an initial 5-year construction period.

2. The economic evaluation of the Project has been carried out in real terms using actual costs during construction and 2004 prices for forecasts. The project cost estimates and financial projections in nominal terms were converted to real terms by removing the effects of foreign and domestic inflation. The basic assumptions are the same as those used during the midterm review and provided in Appendix 8. Costs, the financing plan, and sales volumes and revenues have been revised to reflect existing conditions.

3. Other features of the analysis retained from the approach at appraisal include (i) identification of incremental economic costs, (ii) identification and valuation of major economic benefits, (iii) calculation of the EIRR, (iv) estimation of economic costs and benefits using a domestic price numeraire, (v) shadow pricing based on domestic market price conversion factors and a shadow exchange rate factor for tradable items (Table 3), and (vi) estimation of costs and benefits on a with- and without-project basis.

B. Costs

4. Economic costs have been estimated from the financial costs with the following adjustments: (i) exclusion of price contingencies but inclusion of physical contingencies, (ii) exclusion of all taxes, (iii) shadow pricing was completed for all costs, in particular, the wage of unskilled labor is assumed to exceed its opportunity cost and is adjusted downward while the opposite is the case for skilled labor, (iv) the residual value of physical assets is assumed to equal its remaining book or undepreciated value at the end of the evaluation period.

C. Benefits

5. The nature of social benefits identified during appraisal have not changed. Direct social benefits include (i) creation of a reliable source of high quality water to serve a population of 2.2 million; (ii) reduction in the incidence of water-borne disease associated with the use of contaminated sources; (iii) generation of peak load power; (iv) an order of magnitude reduction in the frequency of flooding on lower reaches of the Feiyun River; and (v) water supply to irrigate an additional 60,000 hectares of cropland.

6. The basis for valuation of benefits used at appraisal is applied here. The willingness to pay for water is assumed to equal the retail price of water in Wenzhou less the local cost for treatment and distribution. The price of power in power purchase agreements is assumed to equal the willingness to pay for power. Annual flood protection benefits are valued at CNY6.8 million as at appraisal. Irrigation benefits were not previously valued. These are valued at

CNY0.03/m³ for delivered irrigation water based on the price farmers currently pay for irrigation water elsewhere in the country. The potential supply of 475 cubic meters (m³) per year is assumed to be needed once every 5 years to offset drought.¹

D. Economic Internal Rate of Return

7. The base case EIRR_[UB1] was determined to be 9.4%. This is lower than the value determined at appraisal due primarily to a reduction in the volume of water assumed to be supplied especially in early years. Cash flow details are presented in Table A9.

8. The sensitivity analysis focuses on tariffs and volumes, the principal sources of uncertainty in the analysis. Increases in costs were also tested to evaluate the implication of errors in cost assumptions. The following pessimistic scenarios were considered to evaluate economic risk:

- (i) increases in water and power tariffs reduced by 50% (i.e., tariffs increase at 90% of the rate of inflation rather than the full rate);
- (ii) raw water sales reduced by 10% to 90% of the base case demand levels;
- (iii) a general increase in costs of 10%; and
- (iv) elimination of agricultural benefits.

9. Overall, the sensitivity analysis suggests that economic performance is not sensitive to variations in the underlying assumptions. The EIRR does not fall below 9.0% in any of the tested scenarios. The stability in economic performance occurs because debt servicing costs, which are fixed, comprise 67% of total cash requirements, power sales are stable and high from the outset resulting in a relatively stable stream of economic benefits associated with power sales, and, finally, willingness to pay for water is based on the retail tariff, which is not affected by the scenario assumptions.

¹ The Project Completion Review Mission did not have sufficient time to secure detailed crop production and budget data with which to make a more accurate evaluation. The current approach based on prevailing irrigation charges is very conservative since those shares are so low.

Table A9: EIRR Calculation
(\$ '000 at 2000 prices)

Year	Capital Investment	Total Noncapital Costs	Power Supply Benefits	Water Supply Benefits	Other Benefits*	Net Annual Value
1997	0	0	0	0	0	0
1998	(251,809)	0	0	0	0	(251,809)
1999	(1,267,735)	0	0	0	0	(1,267,735)
2000	(1,134,112)	0	0	0	0	(1,134,112)
2001	(950,792)	0	0	0	0	(950,792)
2002	(96,663)	(12,579)	209,460	7,962	9,647	118,090
2003	0	(29,364)	226,946	68,119	9,647	275,309
2004	0	(32,631)	231,083	122,968	9,647	331,738
2005	0	(35,322)	231,296	177,817	9,647	386,869
2006	(44,267)	(36,611)	232,249	200,642	9,647	368,375
2007	0	(37,640)	232,272	223,466	9,647	438,972
2008	0	(38,713)	232,294	246,290	9,647	466,148
2009	0	(39,787)	232,314	269,115	9,647	494,252
2010	0	(40,852)	232,333	291,939	9,647	523,332
2011	(177,066)	(41,515)	232,608	304,324	9,647	365,121
2012	0	(42,064)	232,613	316,710	9,647	561,713
2013	0	(42,625)	232,618	329,095	9,647	581,903
2014	0	(43,163)	226,389	341,480	9,647	594,352
2015	0	(43,696)	219,799	353,866	9,647	607,086
2016	(177,066)	(43,748)	213,675	353,866	9,647	428,765
2017	0	(43,676)	207,452	353,866	9,647	604,680
2018	0	(43,622)	201,409	353,866	9,647	603,548
2019	0	(43,569)	195,543	353,866	9,647	602,449
2020	0	(43,515)	189,848	353,866	9,647	601,384
2021	(177,066)	(43,802)	184,149	362,712	9,647	434,161
2022	0	(44,183)	178,787	371,559	9,647	621,257
2023	0	(44,555)	173,582	380,406	9,647	631,534
2024	0	(44,923)	168,527	389,252	9,647	642,041
2025	0	(45,295)	163,620	398,099	9,647	652,762
2026	(177,066)	(45,327)	158,994	398,099	9,647	475,220
2027	0	(45,272)	154,363	398,099	9,647	651,897
2028	0	(45,231)	149,867	398,099	9,647	651,506
2029	0	(45,190)	145,502	398,099	9,647	651,127
2030	0	(45,146)	141,264	398,099	9,647	650,765
2031	(177,066)	(45,105)	137,150	398,099	9,647	473,345
Residual	1,848,384					1,848,384

* Flood reduction = CNY6,800,000/year; Irrigation = CNY2,847,000/year.

Source: Staff Estimates.

RESETTLEMENT

A. Resettlement Planning and Budget

1. The Wenzhou municipal government (WMG) and the former East China Institute of Reconnaissance and Planning, a domestic design institute, prepared a resettlement plan in September 1995. An Asian Development Bank (ADB) mission reviewed it in 1997. The plan reported that 37,256 people from 100 administrative villages would be partially or full affected by the Project and would need to be relocated. Affected persons included 32,516 in the Shanxi reservoir inundation area, 4,732 in the Zhaoshandu reservoir inundation area, and 368 people at the dam sites. Of the affected persons in the reservoir areas, about 88% (32,355 persons) were land based.

2. Under the resettlement strategy, affected persons were encouraged to relocate to communities on the coastal plain, either back into agriculture or into a nonagricultural livelihood. Resettled households received resources and support needed to help them restore their livelihood and well-being and to achieve a standard of living comparable to residents of their host communities. This was a higher standard than simply restoring previous incomes. Physical resources included land, housing, and public infrastructure.

3. The resettlement budget provided in the resettlement plan at appraisal was CNY920 million. The budget was revised in 2001, for the following reasons: (i) changes in resettlement policies that increased compensation for replacing homes and moving; (ii) increases in the estimated value of submerged assets such as infrastructure houses in the inundation areas; (iii) increases due to inflation; and (iv) increases caused by design changes. The Zhejiang Province Planning Committee approved a revised resettlement budget of CNY1,139 million in 2001. By April 2001, CNY974 million (85.5%) had been disbursed. About CNY80 million in project savings are due to the decreased need for farmland for rural affected persons because of more nonfarming resettlement and decreased farmland compensation for host people who voluntarily registered urban citizens in host rural areas rather than rural households. These savings will be transferred to a postrelocation support fund to help relocated households restore their income and livelihoods.

B. Resettlement Impacts

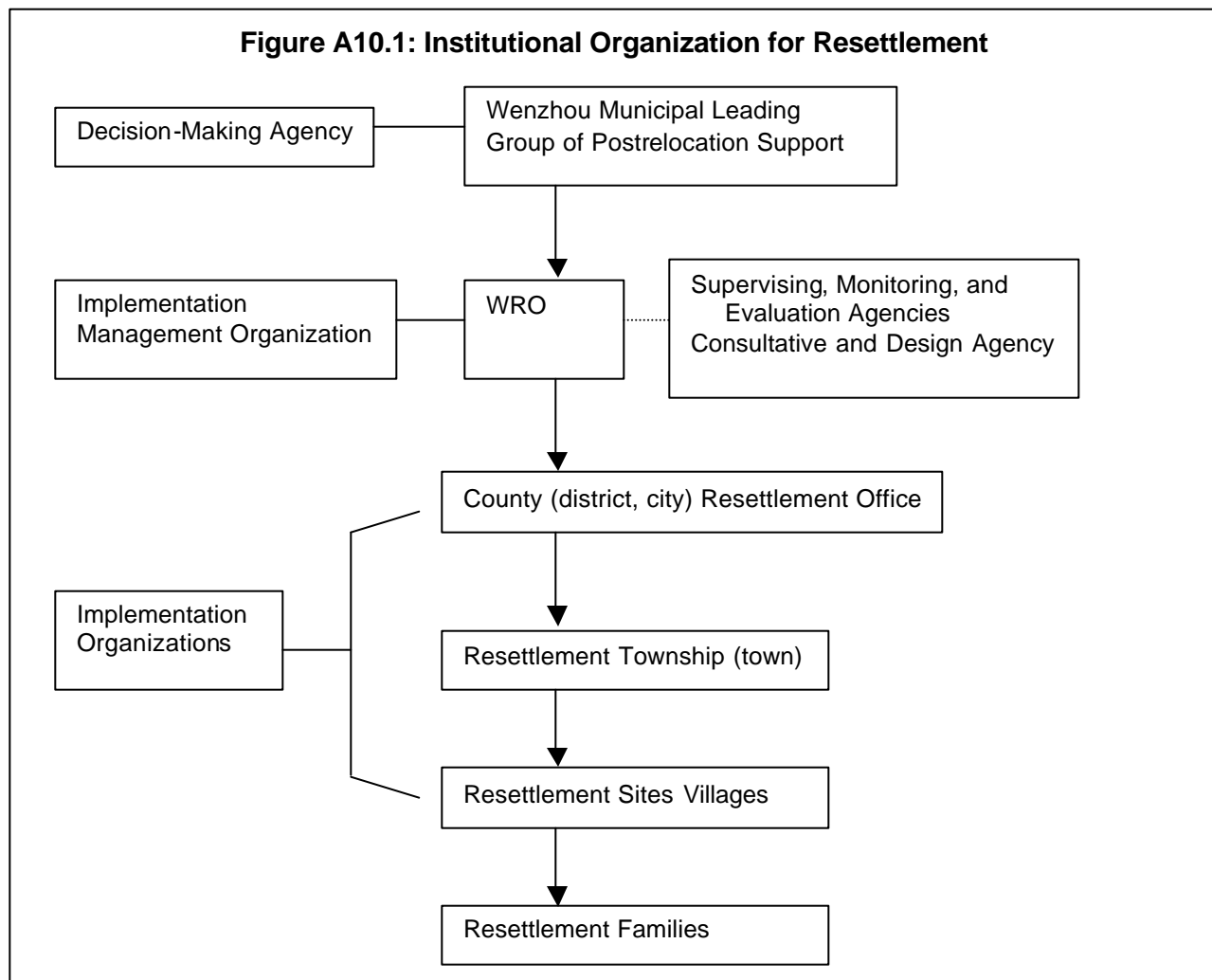
4. Resettlement was completed in December 2003. As of that date, the actual number of affected people was 37,199, a decrease of 57 from the original estimate. These people were moved to 123 resettlement sites in 10 counties or districts within Wenzhou city. About 74% (27,432 persons) were relocated to agricultural sites and 26% (9,767 persons) were resettled to nonagriculture sites. In total, 31,248 (84%) moved to coastal plain and 5,951 (16%) relocated around Shanxi reservoir. Relocation decisions were made after households received help through a participatory program.

C. Resettlement Management, Supervision, and Monitoring

5. Resettlement for the Project was implemented in accordance with regulations issued by the State Council under the Land Management Law. These regulations from the former Ministry of Water Resource and Power stipulate relocation and compensation standards for medium and large-scale conservancy and hydroelectric power projects. Other applicable state standards that were complied with concern construction and village and town planning.

6. Several local policies and regulations were issued to facilitate the resettlement process. Perhaps the most significant were policies that made it easier for host community residents to transfer their registration from farm to nonfarm status and become urban residents. In doing so, they returned their contracted farmland to their village collective and this land then became available for resettlers. This policy was a first for the People's Republic of China. The resettlement is successful for the resellers as most affected people (89%) have restored and improved their income. The host people received the benefit in the clean water supply, land compensation, and other benefits such as the house registration.

7. The Wenzhou Resettlement Office (WRO) under the leadership of WMG was responsible for the resettlement plan. WRO developed an organizational structure to undertake all resettlement plan tasks including administration; project planning, implementation, and supervision; monitoring; finance and accounting. Training was provided to resettlement officers in resettlement planning, project management, financial management, livelihood development, etc. Resettlement offices were established at municipality, county, and township levels (Figure A10). Management rules and procedures were developed covering planning, progress reporting, disbursements, completion inspections, grievances, resettlement supervision, etc. A monitoring system covers the municipal, county, and township resettlement offices and addresses financial management, implementation progress, disbursements, construction, etc.



D. Consultation, Participation, Training, and Grievance Procedures

8. WRO applied a highly consultative and participatory process in the planning, design, and implementation of the Project. All affected persons received full information on the Project itself and on resettlement policies, compensation measures, resettlement options, grievance procedures, and the resettler's legal rights. Resettler representative committees were established in every administrative village 6 to 12 months prior to relocation. Local governments consulted these groups regarding the resettlement plan and they were involved in plan planning and implementation. Senior officials up to the deputy mayor of WMG were directly involved in discussions with representative committees.

9. A grievance mechanism was established at every level of government stipulating processing procedures and deadlines for complaints. Officials were assigned to grievance desks in resettlement offices at all levels. Over 2,500 complaints dealing with such matters as land areas, infrastructure services, and eligibility for resettlement were processed and resolved.

10. Resettlers relocating to the costal plain faced large changes in geography, climate, and cultural and economic conditions. Resettler training programs were implemented to help them adapt. For land-based resettlers, training was provided in the production of lowland paddy rice, specialty crops and livestock, and nonfarm job skills such as factory work and hairdressing. Local manufacturing enterprises were given tax relief in return for providing on-the-job training to resettlers in manufacturing skills. All resettlers participated in training sessions concerning resettlement laws and their legal rights, and they were introduced to the customs and habits of residents in their host communities. About 3,400 rural labors obtained employment in the enterprises and service sector.

E. Relocation Housing and Infrastructure

11. The Project provided public infrastructure including roads, water supply, drainage, electricity, and communications. Access to health and education facilities was also provided to resettlers. Their original homes were primarily wood-frame construction, but their new houses are built of concrete and brick and most have 2 to 4 floors. These new homes are comparable to existing homes in the host communities. House size in the resettlement villages averaged 50 square meters (m²) per capita in 2003 and varied from 43 to 82 m² per capita. In contrast, the house size of affected persons averaged 36 m² per capita prior to resettlement. Housing conditions and the physical environment of the resettlers have improved significantly as a result of the Project.

F. Gender and Vulnerable Groups

12. Vulnerable groups are persons isolated due to age or disability and lacking a family support network, designated poverty households,¹ women, children, and minority ethnic groups. These resettlers needed special attention to address their needs, concerns, and problems.

13. Women were fully involved in village resettlement committees and participated in the entire process of project planning and implementation. Monitoring indicates that women have an active role in new income generating activities and in the management of household income.

¹ "Five guarantee household" (guarantee of food, housing, clothing, medical treatment, and burial) and "three nothing households" (no income, no legal guardian, or a legal guardian with no capacity to provide support).

The lives of women and children have been improved by improved access to better quality education and health facilities.

14. Single person households and designated poverty households included the elderly, disabled persons, households with people suffering chronic diseases, the unemployed, widows, and other extremely poor households. These resettlers have either moved into new houses with assistance under the Project or, in the case of isolated elderly persons, have the opportunity to relocate to a new old age home managed by the government. About 256 single person households were affected by the Project. Of these, 61 persons are now living in the old age home managed by WRO. The other 195 persons chose to live with their relatives and get the additional subsidy and favorable policy in relocation and housing.

15. The resettlement population included 42 families (143 persons) of the Shezu nationality in Taishun and Wenchen counties. The Shezu minority does not differ significantly in culture and livelihoods from the local Han minority. But all of these families were still given special attention and relocated to two villages in Cangnan county so that they could continue to live in close proximity to each other and maintain a coherent community structure. Their livelihoods and living conditions in new resettlement sites are much better than before.

G. Rehabilitation of Livelihoods and Incomes

16. Based on the sample study (38 of the 123 resettlement sites), the living conditions and livelihoods of most of the relocated people have improved. The average annual income per capita in 38 resettlement villages was CNY4,851, 2.73 times the level of CNY1,778 in 1996. Relocated people have more job opportunities in their new communities than in their old villages. Resettlers who moved into nonagricultural livelihoods and who live closer to urbanized areas tend to have higher incomes.

17. The structure of resettler incomes and expenditures has changed. Less income is obtained from agriculture and more from employment and rental of space in their new homes. The proportion of household expenditures on food staples has fallen, while expenditures on such things as higher quality food, medicine, education, and entertainment have increased.

18. The Project has contributed to poverty reduction, but about 11% of affected households have not been able to restore their 1996 income level. The worst-off households in this group resettled in villages around the reservoir or in self-selected relocation sites. WMG and WRO have paid more attention though postrelocation support to help these people restore their livelihoods.

H. Postrelocation Support Plan

19. A 10-year postrelocation support plan (PSP) for Shanxi Multipurpose Dam Project was prepared by the Wenzhou Municipal Resettlement Office in Zhejiang Province and East-China Reconnaissance, Planning and Design Institute in December 2002. The objective of this plan is to help resettlers achieve living standards that match those of the host villagers and obtain access to the same development opportunities that local people have. According to the plan's objectives, resettlers whose production and living standards have not been restored or reached the local villagers' levels should be supported.

20. The scope of the PSP includes all resettlers as well as nonresettlers who were adversely affected by the Project. Under the plan, support will be provided to improve public infrastructure,

improve employment opportunities of nonagricultural resettlers, and undertake economic development planning in the reservoir area.

21. The PSP has two components including the Reservoir Area Construction Fund and Maintenance Fund. This Reservoir Area Construction Fund currently has about CNY10 million each year and should receive contributions from SEDC operations amounting to CNY0.01 per kWh of electricity sold and CNY0.01 per cubic meter of annual water supply sold. The Maintenance Fund is amounted to CNY0.001 per kWh of electricity sold and about CNY1 million each year in total. But WRO has not received any postrelocation support funds or maintenance funds from SEDC since the operation of the power plant and water supply. Current plans indicate a total fund requirement of CNY403 million. During the dam construction period, the special postrelocation support fund with the total CNY10 million from the contingency of resettlement budget has been used to support the resettler's income restoration activities since 1997. It is the first good case to establish the post-relocation support fund integrated with the resettlement budget.

I. Conclusions and Recommendations

22. The resettlement plan was successfully implemented. Affected persons have all been relocated and most chose to relocate to the costal plan. There was a high degree of involvement by resettlers through an extensive participatory program and grievance procedures. Most resettlers now enjoy higher incomes, better housing, and improved access to public services and employment opportunities. Special attention has been given to vulnerable populations. The PSP will assist households who have not restored their preresettlement income levels and should be implemented as soon as possible. The existing resettlement management institution system at the city and county level were efficient and should still be active to enhance the capacity of livelihood development.

23. The PSP needs to be revised in consultation with people affected by the Project to incorporate the additional households that have not achieved their previous income level and implemented by WRO with funding support from SEDC. In line with this, SEDC should contribute immediately to the fund and if SEDC revenues are inadequate, funding responsibility for the PSP should be transferred to WMG. WRO should report to ADB on the implementation of the PSP.

PROJECT RATING ANALYSIS

Table A11.1: Rating Assessment

Criterion	Assessment
A. Relevance	
(i) Relevance of project preparation to project output at the time of appraisal	Highly relevant
(ii) Relevance of project output to achieving project goals and objectives at the time of appraisal	Yes
(iii) Priority of the Project in the context of the country's development strategy at the time of appraisal	Yes
(iv) Priority of the Project in the context of one or more of ADB's strategic objectives at the time of appraisal	Yes
Evaluation rating	3
B. Efficacy	
(i) Achievement of most project physical outcomes	Yes
(ii) Achievement of most project tangible outcomes (e.g., technical assistance)	Partly
(iii) The likelihood that project outcomes will lead to project goals	Yes
Evaluation rating	2
C. Efficiency	
1. Efficiency of Investments	
(i) EIRR > 12% (where recalculated at evaluation)	No
(i) FIRR > weighted average cost of capital (where recalculated at evaluation)	Yes
(iii) Cost-effectiveness of project generating project outputs	Yes
2. Efficiency of Process	
(i) Manner of ADB's internal processing of the Project	Yes
(ii) Organization and management of executing and implementing agencies	100%
(iii) Effectiveness of project management	Yes
(iv) Efficiency in recruiting consultants and other procurement	No
(v) Timely and adequate availability of counterpart funding	Yes
Equivalent Rating	2
D. Sustainability	
(i) Availability of adequate and effective demand for services or products	Yes
(ii) Probable operating and financial performance of the operational entity and its ability to recover costs	Yes, but with poor initial financial performance.

Criterion		Assessment
(iv)	Probability of funds availability (cash flow) for continued operation, maintenance, and growth	Yes
(v)	Probable availability of skills to continue support	Yes
(vi)	Probable availability of appropriate technology and equipment to operate the Project	Yes
(vii)	Probable availability of the enabling environment (subsidies, tariffs, price competitiveness, and political developments) in which the Project operated at the time of evaluation	Yes
(viii)	Government ownership and commitment to the Project	Yes
(ix)	The extent to which the operation affects the environment and renewable or nonrenewable resources	Yes
(x)	The extent to which community participation and beneficiary incentives are adequate to maintain projects benefits	Yes
Evaluation rating		2
E. Institutional Development and Other Impacts		
1. Institutional development impacts		
(i)	Country's formal laws, regulations, and procedures	Yes
(ii)	The people's informal norms and practices	Yes
(iii)	Institutional and organizational strengthening	Partly
(iv)	Participatory attitudes of the society	Yes
(v)	Macroeconomic or sector policy framework	Partly
2. Other development impacts		
(i)	Impacts on poverty	Yes
(ii)	Impacts on the environment	Yes
(iii)	Impacts on social organization	Yes
Evaluation rating		2

ADB = Asian Development Bank, EIRR = economic internal rate of return, FIRR = financial internal rate of return

Table A11.2: Assessment of Project Overall Performance

Criteria^a	Weights		Rating Value (b)	Weighted
	% (a)	Assessment		Rating (a) x (b)
Relevance	25	Highly relevant	3	0.75
Efficacy	25	Efficacious	2	0.50
Efficiency	20	Efficient	2	0.40
Sustainability	15	Likely	2	0.30
Institutional Development and Other Impacts	15	Moderate	2	0.30
Overall Rating		Successful		2.25

^a Highly successful = overall weighted average (OWA) > 2.5, and no criteria less than 2; successful = OWA 1.6-2.5, and no criteria less than 1; less than successful = OA 0.6-1.6, and not less than 2 criteria less than 1; unsuccessful = OWA < 0.6.

Source: Staff estimates.