

PROJECT COMPLETION REPORT

ON THE

HO CHI MINH CITY WATER SUPPLY AND SANITATION PROJECT

(Loan 1273[SF])

IN THE

SOCIALIST REPUBLIC OF VIET NAM

July 2004

CURRENCY EQUIVALENTS

Currency Unit – Dong (D)

		At Appraisal (8 September 1993)	At Project Completion (18 January 2004)
D1.00	=	\$0.000095	\$0.000065
\$1.00	=	D10,500	D15,500

ABBREVIATIONS

ADB	–	Asian Development Bank
DCTPW	–	Department of Communications, Transport, and Public Works
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
HCMC	–	Ho Chi Minh City
HCMCPC	–	Ho Chi Minh City People's Committee
ICB	–	international competitive bidding
MOC	–	Ministry of Construction
O&M	–	operation and maintenance
PCR	–	project completion report
PICC	–	Project Implementation Coordinating Committee
PMU	–	project management unit
SDR	–	special drawing rights
TA	–	technical assistance
UDC	–	Urban Drainage Company
UFW	–	unaccounted for water
WSC	–	Water Supply Company
WTP	–	water treatment plant

WEIGHTS AND MEASURES

km	–	kilometer
m ³	–	cubic meters

NOTES

- (i) The fiscal year (FY) of the Government ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2004 ends on 31 December 2004.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Viet Nam
2.	Loan Number	1273-VIE(SF)
3.	Project Title	Ho Chi Minh City Water Supply and Sanitation Project
4.	Borrower	Viet Nam
5.	Executing Agency	Department of Communications, Transport, and Public Works
6.	Amount of Loan	SDR45.789 million
7.	Project Completion Report Number	VIE 802

B. Loan Data

1.	Appraisal	
	– Date Started	22 April 1991
	– Date Completed	8 May 1991
2.	Reappraisal	
	– Date Started	5 August 1993
	– Date Completed	24 August 1993
3.	Loan Negotiations	
	– Date Started	25 October 1993
	– Date Completed	27 October 1993
4.	Date of Board Approval	29 November 1993
5.	Date of Loan Agreement	28 September 1994
6.	Date of Loan Effectiveness	
	– In Loan Agreement	27 December 1994
	– Actual	10 April 1995
	– Number of Extensions	Three
7.	Closing Date	
	– In Loan Agreement	30 June 1999
	– Actual	17 February 2004
	– Number of Extensions	Three
8.	Terms of Loan	
	– Service Charge	1.00% per annum
	– Maturity (number of years)	40
	– Grace Period (number of years)	10
9.	Terms of Relending	
	– Interest Rate	1.00% per annum
	– Maturity (number of years)	25
	– Grace Period (number of years)	5
	– Second-Step Borrower	Ho Chi Minh City People's Committee

10. Disbursements
a. Dates

Initial Disbursement	Final Disbursement	Time Interval
27 Jul 1995	25 Aug 2003	97 months
Effective Date	Original Closing Date	Time Interval
10 Apr 1995	30 Jun 1999	50 months

b. Amount (\$) ^a

Category or Subloan	Original Allocation	Last Revised Allocation	Amount Canceled	Net Amount Available	Amount Disbursed	Undisbursed Balance
Civil Works Part A	5,901,090	11,893,174		11,893,174	12,617,911	(724,737)
Equipment and Materials Part A	21,530,389	21,582,804		21,582,804	20,584,005	998,799
Equipment Part B	400,314	286,615		286,615	255,856	30,759
Civil Works Part C	3,079,015	2,205,471		2,205,471	1,146,338	1,059,133
Materials Part C	11,380,572	5,402,729		5,402,729	4,953,782	448,947
Civil Works Part D	600,472	1,612,917		1,612,917	1,658,193	(45,276)
Equipment and Materials Part D	1,899,364	982,925		982,925	966,909	16,017
Equipment and Vehicles Part E	2,029,964	3,693,311		3,693,311	1,926,606	1,766,705
Training	559,305	461,069		461,069	182,914	278,155
Familiarization Visits Part E	49,684	42,327		42,327	9,750	32,577
Consulting Services	6,581,057	6,175,956		6,175,956	6,993,690	(817,734)
Loc. Exp. Incremental Staff Salary	299,526	901,750		890,328	454,021	436,307
Service Charge During Construction	1,199,524	1,105,159		1,105,159	1,105,159	0
Unallocated	9,489,725	0	5,020,414	0	0	0
Total	65,000,000	56,323,364	5,020,414	56,323,364	52,855,135	3,568,833

Note: SDR1.00 = \$1.41964 (exchange rate during loan negotiations)

^a Figures vary due to currency fluctuations (special drawing rights against US dollar).

11. Local Costs (Financed)	
– Amount (\$)	6.15 million
– Percent of Local Costs	25
– Percent of Total Cost	9

C. Project Data

1. Project (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	57.7	46.7
Local Currency Cost	23.3	24.5
Total	81.0	71.2

2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower-Financed	8.1	10.3
ADB-Financed	63.8	51.7
Total	71.9	62.0
IDC Costs		
Borrower-Financed	7.9	8.1
ADB-Financed	1.2	1.1
Total	81.0	71.2

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

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

Project Component	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
Base Cost						
- Civil Works	4.6	10.0	14.5	10.1	13.4	23.5
- Equipment Supply and Installation	37.2	0.9	38.1	28.7	1.9	30.6
- Consulting Services	4.9	1.4	6.3	6.6	0.4	7.0
- Administration	0.3	0.5	0.8	0.2	0.7	0.9
Subtotal	47.0	12.7	59.7	45.0	16.4	62.0
Contingencies						
- Physical	4.7	1.3	6.0	0.0	0.0	0.0
- Price	4.8	1.4	6.2	0.0	0.0	0.0
Subtotal	9.5	2.7	12.2	0.0	0.0	0.0
Service Charge	1.2	7.9	9.1	1.1	8.1	9.2
Total	57.7	23.3	81.0	46.7	24.5	71.2

^a Figures may vary due to rounding off.

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	Jan 1994	Apr 1996
Completion of Engineering Designs	Dec 1994	Sep 1997
Civil Works Contract		
Completion of Work		
Hoan An Pumping Station	Sep 1997	Oct 2002
Raw Water Pipeline	Sep 1997	Apr 2002
Thu Duc WTP	Sep 1997	Oct 2002
Hoc Mon Wellfield Development	Dec 1994	Jun 2002
Distribution Network	Dec 1998	Jun 2002
Start of Operations		
Completion of Tests and Commissioning and Beginning of Start-Up		
Hoan An Pumping Station		Oct 2002
Raw Water Pipeline		Apr 2002
Thu Duc WTP		Oct 2002
Other Milestones		
First Extension of Loan Closing Date		Dec 1998
First Cancellation of SDR 2.216 Million		30 Mar 2000
Minor Change in Implementation. Adjustment of Percentage of Financing for Civil Works		19 May 2000
Second Extension of Loan Closing Date		11 Jul 2001
Second Cancellation of SDR 1,560 million		18 Jan 2001
Third Extension of Loan Closing Date		15 May 2003
Closing of Loan Accounts and Cancellation of Undisbursed Loan Balance		17 Feb 2004

SDR = special drawing rights.

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 27 Nov 1993 to 31 Jan 1997	Satisfactory	Satisfactory
From 1 Feb 1997 to 31 Dec 1998	Satisfactory	Unsatisfactory
From 31 Dec 1998 to 23 May 1999	Satisfactory	Partly satisfactory
From 23 May 1999 to 31 Dec 2003	Highly satisfactory	Partly satisfactory

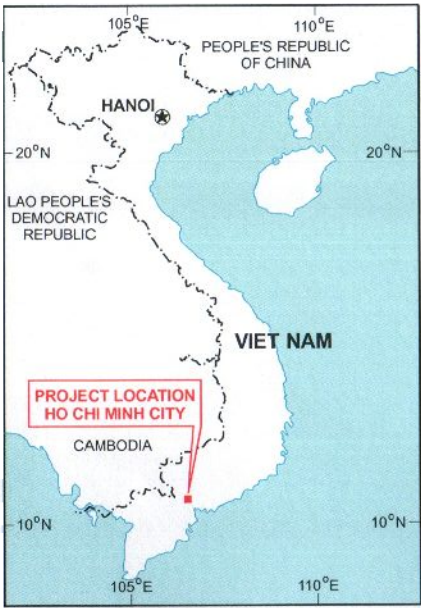
D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members^b
Fact-Finding	19 Feb–9 Mar 1991	6	102	a, f, e(3), b
Appraisal	22 Apr–8 May 1991	5	63	a, c, d, f, e
Reappraisal	5–24 Aug 1993	6	97	a, b, d, f, e(2)
Inception	27 Nov–3 Dec 1993	2	14	a
Loan Review	28 May–3 June 1995	1	7	a
Loan Review	28 Nov–5 Dec 1995	1	8	a
Loan Review	13–22 May 1996	1	10	g
Loan Review	16–21 Sep 1996	1	6	g
Special Loan Review	11–13 Feb 1997	1	3	g
Loan Review	2–6 June 1997	1	5	g
Special Loan Review	8–10 Sep 1997	1	3	g
Loan Review	28–29 Oct 1997	1	2	b
Loan Review	14–19 Dec 1997	1	6	g
Loan Review	22 Jun–3 Jul 1998	1	12	g
Midterm Review	3–13 Nov 1998	2	22	g, h
Loan Review	11–19 May 1999	1	9	g
Loan Review	2–10 May 2000	1	9	g
Loan Review	31 Oct–8 Nov 2000	2	18	g, h
Special Loan Review	19–20 Feb 2001	2	4	g(2)
Loan Review	15–22 May 2001	1	8	g
Loan Review	1–5 Oct 2001	1	5	g
Loan Review	18–22 Feb 2002	1	5	g
Loan Review	24 Jul–2 Aug 2002	1	10	g
Loan Review ^a	24 Mar–1 Apr 2003	1	9	g
Loan Review	25 Aug–5 Sep 2003	2	24	g, h
Project Completion Review ^{a,c}	12–23 Jan 2004	3	36	g, h, i

^a In conjunction with the review of another project.

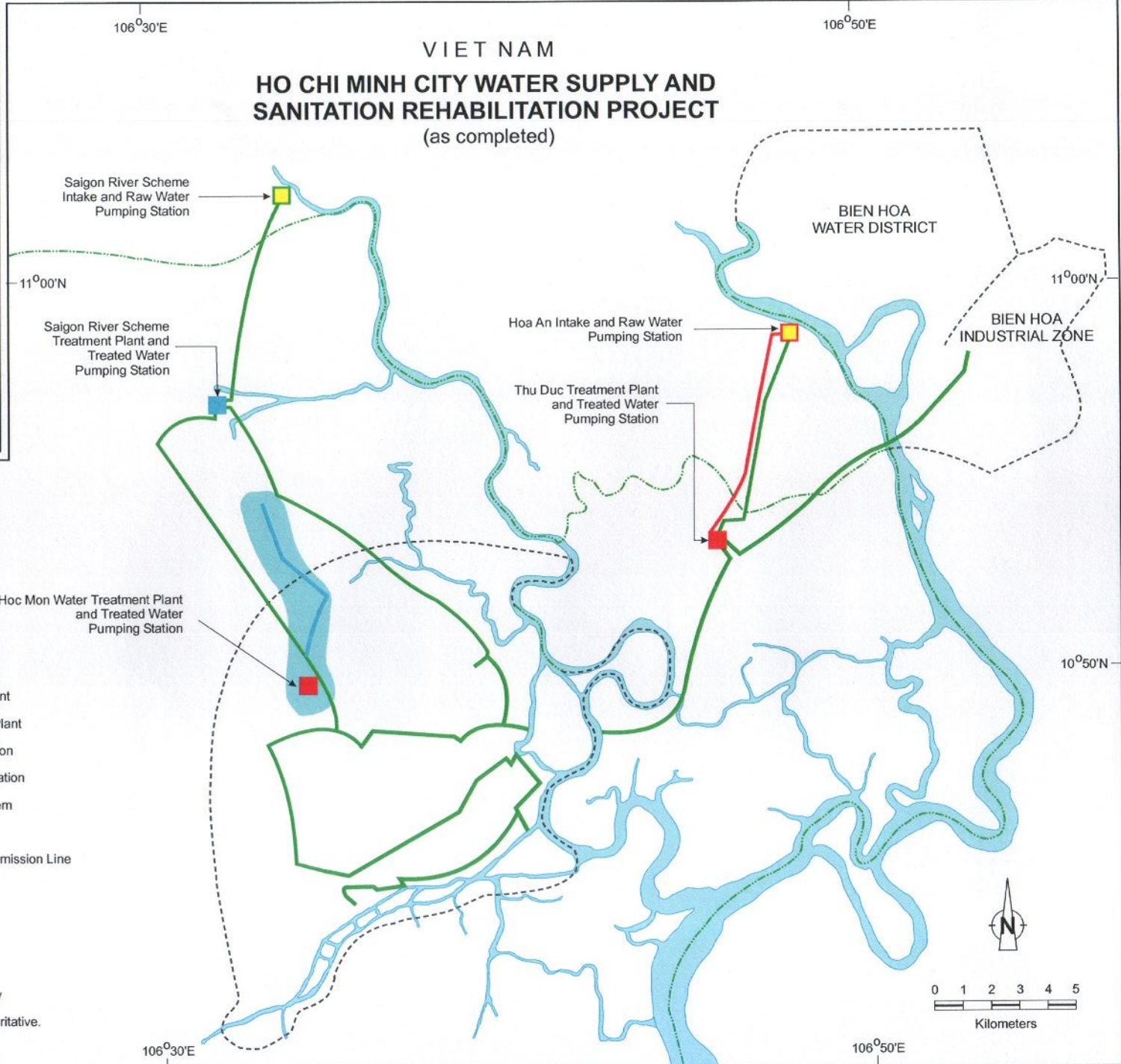
^b a - financial analyst/mission leader, b - manager, c - program officer, d - counsel, e - staff consultants, f - project engineer, g - project specialist, h - project administration officer, and i - project economist.














^c The Project Completion Report was prepared by Yong Ye, Project Economist, MKSS.



VIET NAM

HO CHI MINH CITY WATER SUPPLY AND SANITATION REHABILITATION PROJECT (as completed)



-  National Capital
 -  Existing Treatment Plant
 -  Upgraded Treatment Plant
 -  Existing Pumping Station
 -  Upgraded Pumping Station
 -  Existing Pipeline System
 -  Well System Pipeline
 -  New Raw Water Transmission Line
 -  Wellfield
 -  River
 -  Inner City Boundary
 -  Outer City Boundary
 -  International Boundary
- Boundaries are not necessarily authoritative.

I. PROJECT DESCRIPTION

1. In 1990, the Government of Viet Nam requested the Asian Development Bank's (ADB's) assistance in rehabilitating and upgrading Ho Chi Minh City's (HCMC's) water supply and sanitation facilities. Subsequently, a fact-finding and an appraisal mission were fielded in February and May 1991, respectively. Because of the delay in reactivating ADB operations in Viet Nam, due to the embargo, a reappraisal mission was fielded in August 1993, to validate and update the Appraisal Mission's findings.¹ A loan of SDR45.789 million, or \$65 million, was approved in November 1993.

2. The Project aimed to assist the Government in improving unsatisfactory water supply and sanitation conditions and ensuring the provision of safe, reliable, and sustainable water supply in HCMC, through (i) rehabilitating, with some expansion, water supply and sanitation facilities; (ii) helping the Government implement selected policy reforms, to achieve long-term sustainability of water supply services in HCMC; and (iii) providing necessary institutional and management support, to enable efficient operation of water supply and drainage and sewerage systems. Appendix 1 shows a project framework reconstructed by the Project Completion Report (PCR) Mission.

3. The Project's scope proposed at appraisal consisted of the following parts:

- Part A: Dong Nai River Supply Development
- Part B: Hoc Mon Wellfield Development
- Part C: Rehabilitation of Existing Distribution Network
- Part D: Sewerage and Drainage
- Part E: Institutional Strengthening
- Part F: Engineering Design and Supervision

4. The following technical assistance projects were provided to complement physical project implementation: National Water Tariff Policy Study, Institutional Strengthening of HCMC Water Supply Company (WSC), and HCMC Water Supply Master Plan.

5. The HCMC People's Committee (HCMCPC), through the Department of Communications, Transport, and Public Works (DCTPW) was the Executing Agency, and HCMC WSC was the Implementing Agency and established a project management unit (PMU) that was responsible for implementing all project components. The Project Implementation and Coordination Committee (PICC) was chaired by the Vice-Chairman of HCMCPC and included representatives of government agencies. PICC was established for necessary guidance and assistance for overall project supervision.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

6. The Government's sector objectives—to improve unsatisfactory water supply and sanitary conditions in the country and provide safe water supply to the majority of people in a cost-effective manner—remain unchanged. The Prime Minister Decree Ref. 1600/QD-TTg: Approval of Master Plan of HCMC Water Supply by 2010 and Its Orientation for 2020, dated 24 December 2001, set targets to reach water supply coverage in HCMC of 85% by 2005, 95% by

¹ A project preparatory technical assistance was not conducted.

2010, and 100% by 2020 and further reduce unaccounted for water (UFW) to 28% by 2005 and 26% by 2010. To achieve these targets, the Government emphasized (i) water treatment plant (WTP) and transmission and distribution networks investment, (ii) institutional improvement and capacity strengthening for efficient water supply service, and (iii) full cost recovery and financial autonomy of HCMC WSC.

7. ADB's strategy for Viet Nam at the time of appraisal emphasized supporting economic growth through public investment in infrastructure and environment and human resources development. For the urban water supply and sanitation sector, the strategy identified as the first priority the rehabilitation of the water supply and sanitation systems, particularly the treatment and transmission and distribution facilities in critical urban areas, followed by upgrading and expanding systems in these areas and other selected localities. The strategy also emphasized achieving the long-term viability of water sector utilities, through strengthening sector institutions, planning capacity, management skills and systems, and financial policies and practices.

8. The Project aligned well with the Government's development goals and ADB's strategy. Project design was sound, and no major change in the design occurred during implementation, except for the deletion of the rehabilitation of eight water towers (seven in HCMC and one in Bien Hoa).

B. Project Outputs

9. The quantifiable project outputs specified at appraisal were that (i) the water available for domestic, industrial, and commercial users must be increased by about 175,000 cubic meters (m^3) per day and (ii) UFW must be reduced to 30% at project completion. The physical infrastructure component was substantially completed as appraised, although the UFW reduction fell short of the target. The scope of works proposed at appraisal and executed is given in Appendix 2. The status of the works completed is described in the following paragraphs.

1. Part A: Dong Nai River Water Supply Development

10. The work included upgrading the Hoa An raw water intake facilities, installing new raw water transmission mains from the intake to Thu Duc WTP, and rehabilitating and upgrading the WTP. All works were implemented basically as envisaged. The work provided increased pumping station capacity, from 650,000 m^3 per day to 815,000 m^3 per day, through replacing two bell-mouthed with trash racks and six raw water pumps, which included the installation of electrical equipment and surge control equipment. General renovations to the pumping station were also implemented. All facilities constructed are well operated and maintained, delivering about 785,000 m^3 per day to the Thu Duc WTP. After installing the six pumps and new transmission mains, energy consumption was significantly reduced from 64,858,000 kilowatt-hours in 2001 to 45,705,688 kilowatt-hours in 2003, even with increased water transmission of about 100,000 m^3 per day.

11. A new raw water pipeline, with a prestressed concrete embedded steel cylinder and a pre-cast concrete (PCC) pipe of 2.4 meters in diameter, was installed over 10.8 kilometers, to increase transmission capacity to 815,000 m^3 per day. A junction chamber was constructed, to connect the new 2.4-meter transmission pipe to the existing 1.8-meter transmission pipe and transmit raw water to the Thu Duc WTP and the build-operate-transfer WTP. The pipeline, including 21 butterfly valves, 1 surge anticipating valve, 3 air release valves, 7 combination air-

release and vacuum breaker valves, 7 vacuum breaker valves, 5 sluice gates, and 3 pressure chambers, is operating well and transmitting the designed capacity of raw water to the Thu Duc WTP. The completed pipeline's performance exceeded the designed value of the water loss friction efficiency. The right-of-way is also maintained.

12. The Thu Duc WTP was rehabilitated and improved to increase its treatment capacity from 650,000 m³ per day to 750,000 m³ per day. The works included constructing new flocculation basins, converting existing flocculation basins to sedimentation basins, and installing lime dust control and chlorine gas ventilation systems. Installation of new filter media and filter repairs were excluded from the Project and implemented under the bilateral financing arrangement. The Thu Duc WTP is now equipped with mixing and flocculation basins with 4 rapid mixers and 64 slow mixers, 7 sedimentation basins, 20 filters, and corresponding chemical dosing facilities. The plant is being satisfactorily operated, and it produces treated water of the designed quality and quantity.

13. Four water reservoirs were rehabilitated to meet peak-hour demand up to 2015. Reservoirs 1 and 2 each have a storage capacity of 39,250 m³, and reservoirs 3 and 4 each have a storage capacity of 85,900 m³, leading to a total capacity of 250,300 m³, or about eight hours equivalent of the average daily consumption in 2002. All the reservoirs were completed to the satisfaction of WSC; however, some roof coating requires repair.

14. The Thu Duc treated water pumping station was to be improved to meet 2005 demand by increasing its pumping capacity to 850,000 m³ per day. Although two sets of transmission pumps were replaced, replacement pipes and three sets of valves and actuators could not be installed, as this required stopping plant operations. These pipes and valves will be installed during 2004, after the Saigon River water supply system is put into operation.

2. Part B: Hoc Mon Wellfield Development

15. This component included the rehabilitation of the existing production and treatment plant to enable the system to reach the design capacity of 50,000 m³ per day. The work included replacing seven submersible pumps, three treated water pumps, one backwash pump, and one air blower and installing two chlorinators and other miscellaneous equipment. The improvement of filter basins was financed by the Hoc Mon WSC. The Hoc Mon WSC is satisfactorily operating the system, providing a bulk of 72,000 m³ per day, produced from 33 wells and sent to the HCMC WSC.

3. Part C: Rehabilitation of Existing Distribution Network

16. This component included repair or replacement of about 65 kilometers of water mains, ranging from 100 millimeters to 500 millimeters in diameter; replacement of approximately 1,839 valves, 500 fire hydrants, and 100,000 water meters; and provision of 10,328 replacements for service connections. Detailed design for rehabilitation of the storage reservoirs was completed by the domestic consultants in July 1998. However, the Ministry of Construction (MOC) did not approve the detailed design, because MOC did not believe that water towers would be effective in regulating system pressure in the long run. PICC, during its meeting in November 1999, decided not to proceed with the rehabilitation of existing water towers, which were estimated to cost \$1.5 million, or less than 2% of the total project cost.

4. Part D: Rehabilitation of Existing Sewerage and Drainage Systems

17. This component provided construction of twin box culverts (totaling 645 meters) to convey the flow of the Rach Bung Binh tributary and procure urgently needed sewerage and drainage equipment for the Urban Drainage Company (UDC). Culvert and related service road construction mitigated flooding and environment problems and contributed to commercial activities in the area. The equipment procured included one trailer, one crane truck, one amphibious excavator, three sewage suction vehicles, one jetting vehicle, one car, various pieces of laboratory test equipment, and several computers and printers. Sufficient budget was allocated for operation and maintenance (O&M) of the equipment, and all equipment and vehicles are well maintained and used for routine services. However, the existing capacity of UDC for O&M of the sewerage and drainage systems can hardly meet requirements. O&M equipment is 15% and manpower is 85% of what are considered necessary to conduct routine works.

5. Part E: Institutional Strengthening

18. This component provided logistical support, project vehicles, office equipment, and necessary computers and software for water usage billing and accounting systems. Following the training programs developed under the attached technical assistance² and using the loan funds provided under the component, about 184 WSC staff members received training in corporate planning, organization development, water supply maintenance and management, financial management and accounting, computer systems, and English language skills.

C. Project Costs

19. At project reappraisal, in August 1993, the total project cost was estimated at \$81.0 million, of which \$57.7 million was for foreign exchange costs and \$23.3 million was for local currency costs. The loan was envisaged to finance \$65.0 million (80%) of the total project cost, comprising \$57.7 million for the entire foreign exchange costs (including the service charge on ADB's loan of \$1.2 million) and \$7.3 million for local currency costs. HCMCPC and WSC were to meet the remaining \$16.0 million (20%) of the total project cost (\$6.7 million for civil works, \$1.4 million for duties and taxes, and \$7.9 million for capitalized interest on the amount lent to WSC), to cover the balance of the local currency costs.

20. Upon completion, the actual project cost was \$71.2 million, comprising \$48.2 million for foreign exchange costs and \$23.0 million for local currency costs. ADB financed \$52.8 million, including a service charge of \$1.1 million, and HCMCPC and WSC provided the balance of \$18.3 million. The depreciation of special drawing rights against the US dollar resulted in a decrease in the value of loan proceeds, from \$65.0 million at appraisal to \$61.0 million at completion. Moreover, a total loan fund equal to \$8.6 million was cancelled as a result of lower-than-estimated bid prices and cancellation of the rehabilitation of water towers (estimated to cost \$1.5 million). Details are provided in Appendix 3 and Appendix 4.

21. By category, the costs for civil works increased and those for equipment decreased. The increased civil works costs were insignificant when compared with appraisal estimates, after allocating the physical and price contingencies to the base cost for civil works. The costs for equipment were reduced mainly because of lower-than-estimated bid prices.

² ADB. 1993. *Technical Assistance to the Socialist Republic of Viet Nam for the Institutional Strengthening of HCMC Water Supply Company*. Manila.

D. Disbursements

22. Funds were disbursed in accordance with government and ADB procedures. Disbursements were slow in the early stages of implementation, until 1997, or 4 years after loan approval and 2 years after the loan became effective. Disbursements were made only for the Project's vehicles, computers and office equipment, and advances to consultants. However, following the commencement of procurement for major contracts, disbursements picked up in 1998. An imprest fund was established for PMU in 1995 to facilitate timely disbursements on eligible local expenditures, including small contracts nominated in foreign currencies. The initial imprest fund ceiling of \$0.5 million was increased to \$1.5 million, to accommodate compensation payments and claims of resettled families affected by the Project. The operations of the imprest account were often reviewed by ADB project review missions and the Disbursement Review Mission. The accounts were found to be properly kept and well supported by related vouchers and documents. The annualized imprest fund turnover rate, as of February 2004, was 2.06. Except for the delay in the processing of contractors' claims for major international competitive bidding (ICB) contracts and payments to consultants, HCMCPC and WSC provided the necessary local funds generally on time. Appendix 5 shows the Loan Agreement and actual disbursement schedules.

E. Project Schedule

23. The loan was approved on 29 November 1993. The Project was scheduled for completion on 31 December 1998, with loan closing on 30 June 1999. The loan was, however, signed on 28 September 1994 and became effective on 10 April 1995. The Project was completed in December 2002, 48 months later than planned. This delay resulted mainly from (i) procedural delays on the part of the Government, to approve the Loan Agreement and conclude the Subsidiary Loan Agreement and the Onlending Agreement, which were the two major conditions for loan effectiveness; (ii) consultant recruitment delays; (iii) implementation period delays, during the design and procurement stages; and (iv) construction works delays, including final testing and issuance of control certificates to the contractors.

24. Project implementation started in April 1996, concurrently with the start of consulting services, about 27 months behind the schedule estimated at appraisal. Subsequent delays occurred during the detailed design and procurement stages, due mainly to the need to comply with various government regulations and the lack of PMU and consultant familiarity with these regulations. Government regulations required review and approval by MOC, Ministry of Planning and Investment, and Prime Minister's Office on feasibility studies; engineering design reports; prequalification and bidding documents, including cost estimates for all major contract packages classified as Group A (works under Parts A and C of the Project), while the works classified as Group B (works under Parts B and D) were reviewed and approved by DCTPW and HCMCPC. In general, basic engineering design approval took about 2–3 months, and detailed designs approval took another 1–6 months. Overall, 28 months were taken from the start of engineering design, in April 1996, to the completion of the detailed design, in July 1998, compared to 12 months estimated at appraisal.

25. The supply and installation of equipment and civil works were generally implemented over the lengths of time estimated at appraisal. However, the major civil works contracts could not be completed within the original contractual period, due to a lack of consultant advice in a timely and satisfactory manner and the lengthy government approval process required for adjustments or changes in designs and materials proposed by contractors. For example, the

installation of the new raw water pipeline was implemented over 4 years, compared to 3 years estimated at appraisal, as Government approval with regard to the replacement of the pipe manufacturer and a change in the thickness of the lining, which was not explicitly specified in the bidding document's technical specifications, took almost 1 year.

26. The loan was extended three times, to 30 June 2003. The third extension was made to accommodate pending withdrawal applications, although all the works were substantially completed by 31 December 2002. Appendix 6 shows the actual implementation schedule and the appraisal target.

F. Implementation Arrangements

27. The implementation arrangements were generally satisfactory and worked effectively, as envisaged at appraisal. The Executing Agency for all project components was DCTPW, and the Implementation Agency for all components was HCMC WSC. PMU, headed by an appropriately qualified full-time project manager, was established within WSC in March 1995, prior to loan effectiveness, as required. PICC was chaired by the Vice-Chairman of HCMCPC and included representatives of government agencies. PICC was established in 1995, as required under the Loan Agreement, and provided necessary guidance and assistance for overall supervision in the execution of the Project. PICC met at least every year, and minutes of the meetings were sent to ADB for information.

G. Conditions and Covenants

28. The Executing Agency generally complied with the major covenants. The status of compliance is summarized in Appendix 7. However, WSC did not comply fully with the loan covenant that required the average UFW level of WSC to be gradually reduced to 30% of treated water production by the end of June 1998 (Loan Agreement, schedule 6, para. 7). The UFW recorded in December 2002 was 39% (35% for 2003). The PCR Mission found that the target set at appraisal was too optimistic, as only 65 kilometers out of 1,800 kilometers of distribution pipelines were rehabilitated under the Project, and the higher water pressure needed to transmit an additional 100,000 m³ per day of water tended to increase system leakage. WSC aims to achieve 28% UFW in 2005.

H. Related Technical Assistance

29. The Project was complemented by the three advisory technical assistance programs described in the following paragraphs. These programs were approved in association with the Project. Technical assistance completion reports for the programs are presented in Appendix 8. All technical assistance activities are rated successful.

1. National Water Tariff Policy Study

30. The objectives of the technical assistance were to develop a methodology for the determination of water tariffs and apply this methodology to determine appropriate water tariffs for four selected WSCs (Hanoi, HCMC, Thanh Hoa, and Nha Trang). This was in line with the Government's intention of developing a national water tariff policy that would take into account the financial viability of the individual WSCs and affordability and willingness to pay of water consumers. The findings were discussed at two national seminars conducted in Hanoi and HCMC. The Management Board of Water Supply and Sanitation Development Projects, MOC submitted a summary of the report and results of the seminars to the relevant national and

provincial agencies for review and comments. The management board also organized two training courses in Hanoi and HCMC on water tariff setting methodologies and financial issues in the water supply sector, for financial and accounting staff members of the selected water companies. An interministerial circular on setting water tariffs that adhered to technical assistance recommendations was issued on 27 April 1997. Tariff adjustments for HCMC, which were in line with the new policy recommended under the technical assistance, were put into effect in August 1996, and the tariffs were periodically reviewed and adjusted.

2. Institutional Strengthening of Ho Chi Minh City Water Supply Company

31. The overall objective of the technical assistance was to provide the institutional strengthening necessary to ensure the Project's longer term success, particularly in the areas of management, billing, accounting and financial management, and planning, as the country increasingly moves toward a more decentralized and market-oriented economy. The technical assistance consisted of three parts: Part A: Training Program Development, Part B: Management Information Systems Development, and Part C: Computer Systems Development. Four programs for staff member training and development were prepared under Part A, namely the in-house training program, local external training program, overseas training program, and staff scholarship program, which addressed the priority needs of personnel at all levels. A total of 50 courses were designed for in-house and local training programs, covering corporate planning, organization development, water supply, drainage and sewerage system maintenance and management, financial management and accounting, computer systems, and English language skills. A total of 100 staff members were trained as trainers, and 33 staff members received short-term training at the Metropolitan Waterworks Authority, in Bangkok, under the technical assistance. Following technical assistance recommendations, a training services section was established within WSC, to undertake training activities. Most training programs recommended by the technical assistance were implemented using loan funds. Part B of the technical assistance developed a benefit monitoring and evaluation system for the Project and prepared a framework to strengthen WSC's billing, accounting, and financial management capacities. A guideline on accounting and management information system requirements and specifications was also developed, to guide computer hardware and software procurement under the Project. The management information system software is now working satisfactorily. Part C of the technical assistance developed a software and hardware development plan for WSC, based on the assessment of WSC's immediate and long-term computer needs. Following the plan, the immediately needed computer systems were procured and installed under the Project, with the help of the technical assistance consultant. An information technology division was also established within WSC, to look after information technology services and system maintenance, following the institutional setup recommendations of the technical assistance. As a whole, the technical assistance contributed to significant improvement of the efficiency and overall performance of WSC.

3. Ho Chi Minh City Water Supply Master Plan

32. The objective of the technical assistance was to assist the Government in the development of a master plan for the water supply services in HCMC, to improve health and the urban environment. The technical assistance developed a master plan that included one medium-term and one long-term development program for water supply development in HCMC. The needed institutional improvement and environmental protection considerations were also recommended, to effectively implement the master plan. The ability to prepare medium-term plans was satisfactorily transferred to the HCMC government. The medium-term development program developed by the technical assistance formed the basis for a revised and updated

water supply development plan for HCMC to 2005 that was approved by the Prime Minister in the year 2000. The long-term plan was subsumed in the long-term water supply plan of the HCMC government.

I. Consultant Recruitment and Procurement

33. Selection and engagement of consultants was in accordance with ADB's *Guidelines on the Use of Consultants*. A total of 710 person-months of consulting inputs (210 of international and 500 of domestic consultants) was estimated at appraisal. The contract was signed on 16 February 1996, and the consultants commenced their services in April 1996, 27 months behind the appraisal schedule. The recruitment of the consultants took 10 months, against 6 months estimated at appraisal. The delay of about 4 months was due to the length of time taken to evaluate the consultants' proposals and obtain approval of the draft negotiated contract from government agencies in HCMC and Hanoi. The original consultants' contracts were up to 31 March 2001. However, their services had to be extended for construction supervision until project completion in December 2002. PMU also extended some of their services up to 31 December 2003, to carry out final inspections at the end of the defect liability period of ICB contracts and deliver defects liability certificates. The extensions increased the number of person-months of international (247) and domestic (587) consultants.

34. Procurement was undertaken in accordance with ADB's *Guidelines for Procurement*. Procurement under the Project comprised 66 packages, including 16 ICB, 18 international shopping, 11 local competitive bidding, and 21 direct purchase packages. Delays in procurement activities resulted from (i) need to comply with the Government's rules and regulations relating to procurement and project management, set out in decrees 42/CP and 43/CP; (ii) lack of flexibility of the government agencies concerned, requiring every set of bid documents to be reviewed and approved individually, although the general terms and conditions set out in the bid documents were basically the same; (iii) length of time taken by the Government to make decisions, due to unfamiliarity with project works; (iv) unfamiliarity of PMU staff members and local design consultants with the Government's regulations concerning detailed design and bid document approval, which resulted in unnecessary returns of design works for corrections; (v) unfamiliarity of PMU and consultants with ADB's *Guidelines for Procurement*; and (vi) unclear representations received from the bidders for ICB contracts that had to be clarified prior to ADB's approval for the award of the contract.

J. Performance of Consultants, Contractors, and Suppliers

35. Consultant performance was partly satisfactory. Detailed design was completed in July 1998, 3–6 months behind the schedule established at the start of their services. During project implementation, the consultant failed to satisfactorily provide (i) adequate coordination and assistance to PMU, (ii) clear information and clarification to PMU on various technical issues arising during the construction stage, and (iii) strict schedule control of the contractors' works. These partially contributed to the delays in completing the civil works. While ADB missions repeatedly urged the consultant to develop a detailed implementation schedule, using a critical path method and a list of critical items of works with targeted dates for completion, the consultant rarely met these requirements.

36. Contractor performance was satisfactory. Although some contractors reduced their activities at the sites, in response to delays in payment by the Government, no significant delay in completing the civil works contract resulted from this. The works completed were of satisfactory quality. The contractor for Package A2 managed the difficulties in performing the works without stopping the operation of the Thu Duc WTP. Supplier performance was also

satisfactory. All equipment and materials are of good quality, and delivery was not substantially delayed.

K. Performance of the Borrower and the Executing Agency

37. Overall Borrower and Executing Agency performance is rated satisfactory. PMU was established within WSC in March 1995, with a project manager and two deputy project managers, who were supported by 17 staff members, including an accountant. PMU staff members, although inexperienced with ADB-funded projects at the beginning, were generally qualified in their assigned tasks and managed to become familiar with ADB's guidelines. The current PMU coordinated very well in the implementation of the Project and provided ADB with the required reports in a timely manner. However, PMU was not authorized to make day-to-day decisions. As such, a number of instances occurred where the contractors were unable to continue the works. For example, pending the Executing Agency's decision on the contractors' proposed method of repairing cracks in the concrete walls of the flocculation basins in the Thu Duc WTP, the contractors could not complete the works until an acceptance certificate was issued for the rehabilitation of clear water reservoirs and the installation of transmission pumps.

38. Because this was the first ADB-funded project implemented by HCMC, government staff members had no experience and possessed little knowledge about project implementation, particularly ADB procurement procedures. The Government's complicated procedures, together with the limited capacity of the Executing Agency, were major reasons for significant delays in project implementation. The decision-making authority of DCTPW and WSC was extremely limited, as any changes in scope, cost, procurement methods, and implementation arrangements required the review and approval of central government agencies, including MOC, Ministry of Finance, and Ministry of Planning and Investment, for major contracts, such as ICB contracts, and HCMCPC for other contracts.

L. Performance of the Asian Development Bank

39. During project implementation, from April 1995 to June 2003, ADB dispatched a total of 22 review missions, including the Inception Mission and the Midterm Review Mission. The review missions were effective and instrumental in resolving various implementation issues. Every mission held open discussions with PMU staff members, government agencies, and involved consultants and contractors, to implement the Project in a smooth and timely manner, so that project objectives were achieved satisfactorily. The missions always prepared an aide-memoire, to record discussions and present recommendations for necessary actions to be taken by the responsible parties, which were considered useful. ADB's responses to PMU and other inquiries and proposals were made in a timely manner, without undue delays. Because this was the first project in HCMC, more training workshops should have been held early on concerning the use and application of various ADB guidelines and procedures. Overall, ADB's performance is rated satisfactory.

III. EVALUATION OF PERFORMANCE

A. Relevance

40. The Project was the first phase of a long-term program for the development of water supply and sanitation facilities in HCMC. The Government's two-stage sector development plan gave top priority in 1993 to urgently required rehabilitation works on water supply and sanitation

systems in the country's three largest urban centers,³ emphasizing master plan development for each city and an institutional development program that would improve sector management and O&M capabilities. The Project, aligned well with government policy, was developed as an integrated least-cost approach to improving the water supply and sanitation situation in HCMC and was formulated in close consultation and collaboration with local development agencies and the community. The Project also provided support to the institutional strengthening of HCMC WSC and supported the development of a national water tariff policy and preparation of a water supply master plan for HCMC. The Project is assessed as highly relevant.

B. Efficacy in Achievement of Purpose

41. The Project is assessed as efficacious. The primary objectives of providing safe and reliable water supply and improving sanitation, sewerage, and drainage facilities in HCMC were achieved. The Project strengthened the water supply security of HCMC, as the city now has two raw water transmission pipelines. The Project also increased the system's production by 100,000 m³ per day and reduced UFW from 42% at appraisal to 35% at completion, which enabled about 650,000 additional people in HCMC, besides businesses, industries, and institutions, to receive water supply service.⁴ WSC currently supplies about 1.0 million m³ per day of the treated water to 5.3 million people in HCMC. The construction of the Rach Bung culverts addressed the flooding problem and improved the sanitation, leading to the development of commercial activities in the district.

42. The secondary objectives were to (i) help the Government implement selected policy reforms, to achieve long-term sustainability of water supply services in HCMC, and (ii) provide institutional and management support to WSC and DCTPW, to enable these institutions to operate efficiently and maintain a financially viable water supply, sanitation, and sewerage system in HCMC. These were also achieved. A study on the national water tariff policy was undertaken under one of the Project's attached technical assistance activities, and the study's recommendations were adopted by the Government, via an interministerial circular. The water tariff adjustments for HCMC, which adhered to the new policy, were put into effect in 1996. HCMC's water supply development plan to 2005 was prepared and approved by the Prime Minister in 2000. The institutional and management capacities of WSC and DCTPW were significantly enhanced with the implementation of a comprehensive program under the institutional strengthening component. This program covered staff member training and implemented a training program, developed a management information system, and procured computer systems.

C. Efficiency in Achievement of Outputs and Purpose

43. The Project's economic benefits are (i) cost savings and benefits associated with the increased water supply provided under the Project; (ii) energy consumption and maintenance expenditure reduction, due to system rehabilitation; and (iii) increased land value, due to the construction of the Project's sewerage and drainage component. Although no economic internal rate of return (EIRR) was estimated for the Project in the appraisal report, an EIRR was calculated to assess the Project's economic efficiency. The without project scenario was rebuilt, based on historical records, WSC and PMU discussions, and field visits and surveys. The water supply capacity was increased by 100,000 m³ per day, as a result of rehabilitation and

³ HCMC, Hanoi, and Hai Phong.

⁴ Average water consumption is about 110 liters per capita per day for households without a direct connection and about 150 liters per capita per day for those with a direct connection.

expansion works undertaken under the Project, and the unit water production cost was reduced by 7.1%, due to the use of more efficient pumps and construction of a more efficient raw water pipeline. Site visits and surveys showed that land values around the raw water transmission line increased by 3.5 to 5.0 times, and land values around the rehabilitated sewerage and drainage canal increased by 10.0 to 15.0 times. Although health benefits were anticipated at the appraisal stage, such benefits were not considered in the economic analysis, as no health data was reported in the benefit monitoring reports, and the data may be partially captured in the willingness to pay and land value increases. Project EIRR was 16.4% at completion, higher than the economic opportunity cost of capital in Viet Nam, which is estimated at 12.0%. The sensitivity analysis shows that EIRR is most sensitive to benefits reduction, and a 10.0% reduction in project benefits will reduce EIRR to 14.5%. Appendix 9 gives more details on the economic analysis.

44. The recalculated financial internal rate of return (FIRR) was 7.0%, significantly lower than the appraisal estimate of 13.5%. This was due to (i) long delays in project implementation; (ii) increased electricity consumption in the distribution system, due to the higher water pressure needed to reach the newly connected area, which was not considered at appraisal; and (iii) higher-than-expected UFW rates. UFW in 2003 was about 35%, while 30% was estimated at appraisal. However, the recalculated FIRR is still higher than the weighted average cost of capital for the Project, which was estimated at 4.0%. The sensitivity analysis indicated that FIRR is more vulnerable to decreases in revenue than increases in O&M costs, and a 10.0% decrease in revenue will reduce the FIRR to 5.8%.

45. WSC's overall financial performance is good. Operating revenues were sufficient to cover O&M expenses and depreciation during project implementation. The company realized net income ranging from D12,528 million to D53,234 million during 1996–2002. The company recorded an accumulated cash-cash equivalent of D405 billion by the end of 2002. With the proposed tariff increase in 2004, WSC is very likely to be able to repay its long-term loan from its internally generated incomes. Appendix 10 presents the detailed financial analysis.

46. Based on this analysis, the Project is assessed as efficient.

D. Preliminary Assessment of Sustainability

47. All project facilities were completed generally in accordance with the required specifications and are considered to be of a quality that will ensure the continuous achievement of project benefits over the Project's economic life. WSC is staffed with a total of 2,089 people, which appears reasonable, as the staffing ratio represents the equivalent of about seven staff members per 1,000 house connections. WSC has a technical division, with 380 engineers, including water supply engineers and mechanical and electrical engineers. In addition, WSC employs 224 technicians and 1,485 workers. The O&M capacity of these staff members is generally sufficient to satisfactorily operate and maintain the completed project facilities, but this capacity still needs further strengthening in some areas, such as UFW reduction, to enhance the system's operational efficiency and ensure the facilities' sustainability on a long-term basis. WSC probably will generate adequate revenue to recover O&M costs and depreciation and allocate sufficient funds for adequate O&M of water supply facilities and for future continued growth (para. 45). Overall, the Project's sustainability is assessed as likely.

E. Environmental, Sociocultural, and Other Impacts

48. As expected at appraisal, the Project was environmentally beneficial. Being mainly a rehabilitation project, many of the construction works under the Project were carried out on

existing sites and within existing structures. Environmental impacts associated with these construction works were negligible, and the initial environmental examination adequately assessed the environmental effects that resulted from project implementation. The construction of a new raw water pipeline and replacement of water distribution pipelines helped reduce the opportunity for the contamination of piped water by polluted groundwater. The clearing of severe blockages in the sewerage and drainage system in the Rach Bung Binh culvert improved the sanitation situation and reduced flooding caused by a mixture of sewage and storm water. As evidence, the land value around the Rach Bung Binh culvert area increased significantly. The supply of drainage maintenance equipment and provision of training facilitated the improvement of UDC's O&M capability for HCMC's drainage and sewerage system throughout the city. The occupational health conditions of WTP chemical handling workers were improved with the upgrade of the chlorine handling facilities and enclosure of the chlorine storage area.

49. During the Project's design preparation, continuing the practice of discharging filter backwash water and sedimentation tank sludge to the Dong Nai River was proposed. Therefore, no funds were provided in the Project for the treatment of backwash and sludge-wash water. The situation should be reviewed periodically. Moreover, an indirect environmental impact of the water supply component that expanded water production capacity by 100,000 m³ per day is an increased quantity of sewage discharged to rivers and watercourses within the city. The additional waste loads may cause further deterioration of the receiving waters. HCMC is well aware of the need for a major upgrade of the existing sewerage and drainage systems and for providing wastewater treatment to control the city's deteriorating environment, which resulted from population growth and economic development over the past decade.

50. The Project greatly strengthened the city's water supply safety and reliability by constructing a new raw water pipeline and substituting new transmission pipelines for old and obsolete raw water transmission pipelines that were in danger of bursting at any time, which would leave the city without water for an extended period. Health benefits are expected from reduced sewage and storm water flooding and water contamination in the distribution pipeline. Before the Project, three-fourths of families had to get up at night to collect water, due to very low daytime water pressure. Distribution networks rehabilitation enabled the system to be operated at a higher pressure level and provide around-the-clock water supply that lessened the burden of the life interruption caused by unreliable water supply service. With the expansion of the treated water production capacity by 100,000 m³ per day, the Project enabled water supply to about 100,000 new household connections, and women and children are the major beneficiaries of this project effect, as each household without a water connection had to spend more than half an hour per day collecting water from other sources and about 76% and 5% of water collecting tasks were performed by women and children, respectively.

51. The construction of the raw water transmission pipeline affected 411 households (2,042 people), among which 123 households (612 people) were resettled. Relocation was completed in June 1999, before commencing construction. The sewerage and drainage canal's rehabilitation at Rach Bung Binh affected 319 households (1,932 people), among which 120 households (735 people) were resettled. The relocation was completed in August 1999. In general, the procedures given in the resettlement plan were carefully followed. The affected people were fully informed and closely consulted on resettlement and compensation options, and grievances were reasonably addressed.⁵ The households were either relocated within the

⁵ Each affected household was provided with a set of documents and information related to the Project, including people's rights related to compensation and resettlement and new resettlement sites. A series of meetings with the affected people was arranged to (i) collect information and carry out consultations, (ii) prepare detailed inventory, (iii) prepare agreements, and (iv) redress grievances.

same neighborhoods or compensated by cash, in accordance with Viet Nam's laws and regulations. In general, people understood the utility of the Project and accepted to move as the authority requested. In fact, some households in Rach Bung Binh recognized the high degree of pollution in the area, so they accepted to move voluntarily.

52. Overall, the Project's other impacts are assessed as substantial.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

53. Despite a 4-year implementation delay, caused mainly by the Government's complicated regulations and procedures, the Project achieved its primary and secondary objectives. Taking into account the Project's rating against ADB's five evaluation criteria (relevance, efficacy, efficiency, sustainability, and institutional and other development impacts), the Project is rated successful on a four-category scale (highly successful, successful, partly successful, and unsuccessful).⁶ A detailed project performance assessment and project rating, based on Operations Evaluation Department's (OED's) standard weighted rating system, are given in Appendix 11.

B. Lessons Learned

54. Based on the preliminary assessment of the Project, the lessons learned are

- (i) project implementation periods should be carefully examined and determined during appraisal, taking into account government regulations for preparation of detailed design and bidding, bid evaluation, and scope changes;
- (ii) UFW projection at 30% by December 1998, covenanted in the Loan Agreement, was too ambitious, given the increased water pressure after the Project and the limited inputs to the improvement of distribution networks (rehabilitation of 65 kilometers of pipelines against a total length of over 1,800 kilometers);
- (iii) qualified consulting firm and staff member selection are the keys for successful project implementation, and high priority should be given to the selection of consultants who are familiar with local rules and regulations related to project implementation;
- (iv) government project staff members should be given training prior to the implementation of a project, to familiarize them with various ADB guidelines and procedures for project implementation; and
- (v) bidding documents specifications should be explicit, with provision of specific values and quantities that the contractors shall follow, to facilitate the authority to supervise the works.

⁶ This PCR is part of a sample of PCRs independently reviewed by the Operations Evaluation Department. The review has validated the methodology used and the rating given.

C. Recommendations

1. Project-Related

55. Project-related recommendations include the following:

- (i) HCMCPC and WSC should ensure that adequate funds are allocated for O&M of all completed project facilities, including those under Part D: Sewerage and Drainage.
- (ii) HCMC should consider constructing new treated water transmission pipelines and primary mains that will be essential in ensuring the stable supply of water to the city, as the existing transmission pipeline is a single pipeline delivering water to the entire city and is nearly 40 years old.
- (iii) HCMC should use its own funds, through external assistance, or other arrangements to meet the 2020 target by implementing Hoa An Raw Water Pumping Station, Existing 1,800 Millimeter Raw Water Pipelines, Existing 2,000 Millimeter Treated Water Transmission Pipeline, Construction of New Treated Water Transmission Pipelines, Water Losses Control Program, Expansion and Rehabilitation of the Network Facilities, and Thu Duc WTP Expansion.
- (iv) HCMC should also consider prioritizing rehabilitation of the 1.8-meter raw water pipelines, as rehabilitation will lead to the minimum pumping cost or energy consumption at the Hoa An pumping station.
- (v) WSC should continue the implementation of the water loss reduction program, through the rehabilitation of networks and training of technical staff members concerned.
- (vi) WSC should examine its future capital investment plan carefully and continue to review O&M expenditures and debt service requirements annually. When necessary, the tariffs should be increased to ensure the financial sustainability of WSC.
- (vii) HCMC should continue to strengthen the capacity of UDC and provide additional O&M equipment and staff members, as the existing O&M equipment for sewerage and drainage services is only 15% and manpower is only 85% of what are considered necessary to conduct routine works.
- (viii) HCMC should upgrade its existing sewerage and drainage systems and provide wastewater treatment, as these are critical in preventing the city's environment from deteriorating in the future as a result of Thu Duc WTP's water production capacity increase of 100,000 m³ per day and the completion of a new build-operate-transfer WTP that will lead to an increased quantity of sewage and wastewater being discharged to rivers and watercourses within the city.

2. General

56. General recommendations are as follows:

- (i) Legal frameworks defining the areas of responsibility of respective agencies concerned in the implementation of projects should be established prior to the

implementation of projects, and decision-making authority should be delegated to executing agencies and PMUs, as much as possible.

- (ii) Government rules and regulations relating to implementation of externally financed projects should be simplified, to avoid undue delays in project implementation. In order to address this issue, the implementation of harmonization procedures agreed between the Government and ADB should be accelerated.
- (iii) Capacity strengthening of government personnel assigned to projects should be conducted through training workshops held prior to implementation, particularly where executing agencies and project staff members have no experience in the implementation of ADB-financed projects and are therefore unfamiliar with various ADB procedures, including those related to procurement.
- (iv) Complex and time-consuming procedures and checking mechanisms required at the municipal and central government levels should be streamlined, as these can delay payments to contractors.
- (v) Project benefit monitoring and evaluation plans should be prepared before loan negotiations. More guidance should be provided to the project management office in developing meaningful and measurable performance indicators, particularly on economic and social aspects and viable monitoring methodologies.

PROJECT FRAMEWORK¹

Design Summary	Appraisal Targets	Project Achievements	Monitoring Mechanisms	Key Issues and Recommendations
Goal Improved physical well-being and health of the population	No indicator proposed to assess the achievement of goals, such as incidence of diseases, only cases of recorded diarrhea for the first 6 months of 1993 (11,204) given	Not enough time to measure the Project's health impacts, and impacts not in health statistics	Health and socioeconomic statistics	Need to monitor water-related diseases
Purpose 1. Provide safe and reliable water supply 2. Provide improved urban environment to Ho Chi Minh City 3. Help the Government implement selected policy reforms, to achieve long-term sustainability of water supply services in Ho Chi Minh City	Increase the water available for domestic, industrial, and commercial consumption by 175,000 cubic meters per day No indicator proposed Assist the Government in formulating the National Water Tariff Policy Prepare master plan for water supply development in Ho Chi Minh City up to the year 2015	Water sold in 2003 increased by about 135,000 cubic meters per day Economic development and significantly rising land values observed in the Rach Bung Binh area Interministerial circular on setting water tariffs that adhered to the recommendations of the Project issued on 27 April 1997 Water tariff adjustments for Ho Chi Minh City that adhere to the water tariff policy put into effect in August 1996 Master plan approved by the Government in 2000, based on the recommendations of the Project	Benefit monitoring and evaluation reports, audited Water Supply Company financial reports, land value at the market, and related government circulars and decrees	Unaccounted for water higher than appraisal projection, and must further reduce unaccounted for water to achieve appraisal targets Ensure adequate funds allocated for operation and maintenance of drainage facilities
4. Provide institutional and management support to the Ho Chi Minh City Water Supply Company and the Department of Communications, Transport, and Public Works, to enable	Ensure successful operation and maintenance of project facilities	Water supply facilities properly operated and maintained, and the Water Supply Company highly likely to sustain operation		

¹ No project framework was developed during appraisal. This framework was reconstructed by the Project Completion Report Mission.

Design Summary	Appraisal Targets	Project Achievements	Monitoring Mechanisms	Key Issues and Recommendations
them to operate efficiently and maintain a financially viable water supply, sanitation, and sewerage system in Ho Chi Minh City				
Outputs and/or Components				
Part A: Dong Nai River Water Supply Development	Repair and modify the Hoa An raw water pumping station; construct a replacement 10.8-kilometer raw water transmission pipeline, approximately 2.4 meters from the pumping station to the Thu Duc water treatment plant; and repair and modify the treatment plant, including chemical and instrumentation equipment and filters and treated water reservoirs and buildings	Achieved all appraisal targets, and water transmission and treatment capacity increase of 100,000 cubic meters per day	Benefit monitoring and evaluation reports, progress reports, other consultants' reports, and Asian Development Bank's review mission reports and project completion report	
Part B: Hoc Mon Wellfield Development	Supply and install water treatment equipment for the treatment of water drawn from tube wells	Achieved all appraisal targets, and producing 72,000 cubic meters per day of treated water		
Part C: Distribution System	Rehabilitate existing system, reduce leaks, improve supply pressures, provide new service connections, and replace water meters and valves and fire hydrants Reduce unaccounted for water to 30% by 31 December 1998 Clean existing sewers and drains and carrying out urgent repairs	Achieved all appraisal targets, except for the construction of eight water towers System unaccounted for water 35% in 2003		Reduce unaccounted for water to 28% in 2005, appraisal targets ambitious
Part D: Sewerage and Drainage	Provide urgently needed drainage and sewerage equipment Establish a project management unit with	Twin 645-meter box culverts constructed, to convey the sewage and drainage flow of the Rach Bung Binh tributary		Operation and maintenance equipment still inadequate to meet the requirement

Design Summary	Appraisal Targets	Project Achievements	Monitoring Mechanisms	Key Issues and Recommendations
	necessary equipment, service vehicles, and other logistic support	Package of sewerage and drainage equipment procured for the Urban Drainage Company		
Part E: Institutional Support	Provide training to the Department of Communications, Transport, and Public Works; a project management unit; and the Water Supply Company	<p>A project management unit established in March 1995, and necessary equipment, service vehicles, and other logistic support provided to that unit</p> <p>Training programs on leak detection and repair, new technology for water treatment, management development, and operation and maintenance of the water supply and drainage and sewerage systems</p>		
Part F: Consulting Services	Assist a project management unit with project implementation and institutional strengthening	An international consulting firm associated with a domestic consulting firm engaged from March 1996 to December 2003, for preparation of detailed design and construction supervision of the Project		
Activities and/or Inputs Part A: Dong Nai River Supply Development	Resources and Schedule \$31.3 million Start: Quarter IV 1994 Complete: Quarter III 1997	Resources and Schedule \$40.4 million Start: Quarter II 1998 Complete: Quarter IV 2002	Progress reports, procurement contracts, other consultants' reports, and Asian Development Bank's review missions and project completion report	Four-year implementation delay, due mainly to the Government's complicated requirements and procedures, as well as the Executing Agency's and consultants' unfamiliarity with these requirements and procedures
Part B: Hoc Mon Wellfield Development	\$0.5 million Start: Quarter III 1994 Complete: Quarter IV 1994	\$0.3 million Start: Quarter IV 1998 Complete: Quarter II 2002		

Design Summary	Appraisal Targets	Project Achievements	Monitoring Mechanisms	Key Issues and Recommendations
Part C: Rehabilitation of Existing Distribution Network	\$16.0 million Start: Quarter II 1994 Complete: Quarter IV 1998	\$6.7 million Start: Quarter IV 1998 Complete: Quarter II 2000		
Part D: Sewerage and Drainage	\$2.7 million	\$3.4 million Start: Quarter IV 1998 Complete: Quarter III 2000		
Part E: Institutional Strengthening	\$2.7 million Start: Quarter I 1994 Complete: Quarter IV 1998	\$4.3 million Start: Quarter II 1995 Complete: Quarter IV 1998		
Part F: Engineering Design and Supervision	\$6.3 million Start: Quarter I 1994 Complete: Quarter IV 1998	\$7.0 million Start: Quarter II 1996 Complete: Quarter IV 2003		

LIST OF WORKS PROPOSED AT APPRAISAL AND ACTUALLY IMPLEMENTED

Description of Work	Unit	Estimated at Appraisal	Actually Implemented
Part A: Dong Nai River Water Supply Development			
Repair and modification of the Hoa An raw water pumping station			
- Implementation of structural improvement and civil works	LS		
- Installation of raw water pumps	unit	6	
- Installation of intake bell-mouthed trash tacks	unit	2	
Construction of a replacement raw water transmission main			
- Installation of raw water pipeline (2.4 meters in diameter)	km	10.8	10.8
- Installation of a junction chamber	no.	1	1
- Installation of butterfly valves (400–1,800 millimeters)			
- Installation of a surge anticipating valve	no.	18	21
- Installation of air release valves	no.	1	1
- Installation of a vacuum breaker valve	no.	20	3
- Installation of sluice gates (1,600–2,400 millimeters)	no.	1	7
- Installation of a combination air release and vacuum breaker valve	no.	5	7
- Installation of a pressure chamber	no.		3
Repair and rehabilitation of Thu Duc treatment plant			
- Construction of flocculation basins (785,000 cubic meters per day)	no.		
- Rehabilitation of Thu Duc water treatment facilities, including conversion of flocculation basins to sedimentation basins	LS		1
- Installation of new filter media and filter repairs			
- Installation of laboratory equipment	LS		
- Rehabilitation of four clear water reservoirs (nos. 1, 2, 3, and 4)	no.	4	4
Part B: Hoc Mon Wellfield Development			
Supply and Installation of groundwater treatment equipment			
- Replacement of existing turbine pumps with submersible pumps	unit	7	7
- Replacement of treated water pumps and butterfly valves	unit	3	3
- Replacement of backwash pumps and check valve	unit	1	1
- Replacement of air blower	unit	1	1
- Installation of two chlorinators	unit	2	2
- Repair of two flow meters	no.	0	
Part C: Distribution System			
Rehabilitation of existing system and water towers			
- Replacement of old distribution mains (100–500 millimeters)	km	65.0	65.0
- Supply of DI (200–500 millimeters)	m		36,415
- Supply of uPVC (100–150 millimeters)	m		38,010
- Replacement of valves	no.	200	1,839
- Replacement of fire hydrants	no.	500	500
- Replacement of service connections	no.	45,000	10,328
- Replacement of water meters (15–75 millimeters)			

Description of Work	Unit	Estimated at Appraisal	Actually Implemented
- Rehabilitation of deep wells	no.	100,000	100,000
- Rehabilitation of water towers	no.	17	0
	no.	8	0
Part D: Sewerage and Drainage			
Rehabilitation of existing sewers and drains and provision of drainage and sewerage equipment			
- Rehabilitation of existing drainage and sewerage systems	m		0
- Construction of Rach Bung Binh culvert	m	645	645
Supply of maintenance equipment	LS	1	1
Part E: Institutional Support			
Provision of logistical support and equipment and service vehicles and training to DCTPW, PMU, and WSC			
- Provision of equipment, vehicles, and computerization	\$ mn	2.1	3.4
- Provision of training	\$ mn	0.6	0.2
- Implementation of incremental staff salaries	\$ mn	0.3	0.7
Part F: Consulting Services			
Provision of consulting services for design and supervision of construction of Parts A, B, and C			
- Provision of international consultant services	p-m	210	247
- Provision of domestic consultant services	p-m	500	587

DCTPW = Department of Communications, Transport, and Public Works, DI = ductile iron, km = kilometer, LS = local shopping, m = meter, mn = million, no. = number, p-m=person-month, PMU = project management unit, uPVC = Unplasticized Polyvinyl Chloride, WSC = Water Supply Company.

PROJECT COSTS
(\$ million)

Project Component	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
A. Base Cost						
Part A: Dong Nai River Supply Development						
a. Civil Works	2.9	6.2	9.1	8.1	11.7	19.8
b. Equipment	21.5	0.7	22.2	20.6	0.0	20.6
Part B: Hoc Mon Wellfield Development						
a. Equipment	0.4	0.1	0.5	0.3	0.0	0.3
Part C: Rehabilitation of Distribution Network						
a. Civil Works	1.5	3.2	4.7	0.8	0.8	1.7
b. Equipment	11.4	0.0	11.4	5.0	0.1	5.0
Part D: Sewerage and Drainage						
a. Civil Works	0.2	0.6	0.8	1.2	0.9	2.1
b. Equipment	1.9	0.0	11.4	1.0	0.3	1.3
Part E: Institutional Strengthening						
a. Equipment and Vehicles	2.0	0.1	2.1	1.9	1.5	3.4
b. Training	0.3	0.2	0.5	0.2	0.0	0.2
c. Familiarization visits to ADB	0.1	0.0	0.1	0.0	0.7	0.7
d. Incremental Staff Salaries	0.0	0.3	0.3	0.0	0.7	0.7
Part F: Engineering Design and Supervision	4.9	1.4	6.3	6.6	0.4	7.0
Subtotal	47.0	12.7	59.7	45.6	16.4	62.0
B. Contingencies						
1. Physical	4.7	1.3	6.0	0.0	0.0	0.0
2. Price	4.8	1.4	6.2	0.0	0.0	0.0
Subtotal	9.5	2.7	12.2	0.0	0.0	0.0
C. Service Charge During Construction						
	1.2	7.9	9.1	1.1	8.1	9.2
Total	57.7	23.3	81.0	46.7	24.5	71.2

ADB = Asian Development Bank, WTP = water treatment plant.

FINANCING PLAN AT APPRAISAL AND ACTUAL
(\$ million)

Source	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
Implementation Cost						
Borrower-Financed	0.0	8.1	8.1	0.0	10.3	10.3
ADB-Financed	56.5	7.3	63.8	45.6	6.2	51.7
Subtotal	56.5	15.4	71.9	45.6	16.4	62.0
Service Charge						
Borrower-Financed	0.0	7.9	7.9	0.0	8.1	8.1
ADB-Financed	1.2	0.0	1.2	1.1	0.0	1.1
Subtotal	1.2	7.9	9.1	1.1	8.1	9.2
Total	57.7	23.3	81.0	46.7	24.5	71.2

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

**BREAKDOWN OF YEARLY DISBURSEMENTS OF ASIAN DEVELOPMENT BANK AND
GOVERNMENT FUNDS**

Year	Quarter	ADB		HCMC WSC		Total
		Amount	Cumulative	Amount	Cumulative	
(A)	(B)	(C)	(D)	(E)	(F)	(D + F)
1995	II	0.000	0.000	0.000	0.000	0.000
	III	0.500	0.500	0.013	0.013	0.513
	IV	0.000	0.500	0.019	0.031	0.531
1996	I	0.811	1.311	0.037	0.068	1.379
	II	0.107	1.418	0.036	0.104	1.522
	III	0.219	1.637	0.065	0.169	1.806
1997	IV	0.156	1.793	0.020	0.190	1.983
	I	0.343	2.136	0.103	0.292	2.428
	II	0.959	3.095	0.263	0.555	3.650
1998	III	1.640	4.735	0.371	0.927	5.662
	IV	2.634	7.369	0.613	1.540	8.909
	I	1.430	8.799	0.345	1.885	10.684
1999	II	1.330	10.129	0.069	1.954	12.083
	III	5.640	15.769	0.394	2.348	18.117
	IV	2.237	18.006	0.393	2.741	20.747
2000	I	0.849	18.855	0.152	2.893	21.748
	II	0.434	19.289	0.111	3.004	22.293
	III	0.920	20.209	0.824	3.828	24.037
2001	IV	1.805	22.014	1.076	4.904	26.918
	I	0.699	22.713	1.028	5.931	28.644
	II	2.524	25.237	0.260	6.191	31.428
2002	III	1.614	26.851	1.077	7.268	34.119
	IV	5.587	32.438	2.176	9.444	41.882
	I	4.582	37.020	0.121	9.565	46.585
2003	II	2.327	39.347	1.385	10.950	50.297
	III	1.785	41.132	0.697	11.647	52.779
	IV	0.508	41.640	1.697	13.344	54.984
2004	I	1.536	43.176	0.383	13.727	56.903
	II	1.998	45.174	1.636	15.363	60.537
	III	0.703	45.877	0.677	16.039	61.916
2005	IV	2.156	48.033	1.837	17.876	65.909
	I	2.195	50.228	0.304	18.180	68.408
	II	0.537	50.765	0.139	18.319	69.084
2006	III	2.133	52.898	0.030	18.349	71.247
Total			52.898		18.349	71.247

ADB = Asian Development Bank, HCMC WSC = Ho Chi Minh City Water Supply Company.

PROJECT IMPLEMENTATION SCHEDULE

Project Component	Year										
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
Part A: Dong Nai River Supply Development											
1. Repairs and modifications to Hoa An Raw Water Pump Station											
2. Replacement of raw water pipeline											
3. Repairs and modifications to Thu Duc Water Treatment Plant											
Part B: Hoc Mon Wellfield Development (Phase 1, Stage 1)											
Part C: Rehabilitation of Existing Distribution Network											
Part D: Institutional Strengthening											
1. Project Management Unit											
2. Support to Water Supply Company											
Part E: Engineering Design and Supervision											

Legend:

Design and Implementation (Appraisal)

Design and Implementation (Actual)

COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Loan Agreement	Status of Compliance
A. Project Implementation		
Executing and Implementing Agencies		
1. HCMCPC, through DCTPW, shall be the Executing Agency for all parts of the Project.	Schedule 6, para. 1	Complied with.
WSC shall be the Implementing Agency for all parts of the Project.	Schedule 6, para. 1	Complied with.
Project Management Unit		
2. Prior to the effectiveness of the loan, HCMC shall establish a project management unit in WSC and shall appoint a qualified and experienced project manager.	Schedule 6, para. 2	Complied with. A PMU was established in March 1995 and became fully operational in June 1995.
Project Implementation Coordination Committee		
3. Prior to the effectiveness of the loan, the Project Implementation Coordination Committee shall be established. PICC shall meet at least semiannually, and the minutes of the meetings shall be sent to ADB.	Schedule 6, para. 3.	Complied with.
Familiarization Visits		
4. Key personnel responsible for implementation of the Project shall be sent to ADB for a study visit during the course of project implementation.	Schedule 6, para. 4	Complied with. A delegation of 12 people was sent to ADB in March 1996.
B. Financial Matters		
Tariff Review		
5. HCMCPC shall conduct an annual review of the water supply tariff rates, to ensure that WSC recovers its expenses in full and maintains a debt service coverage ratio of at least 1:1 from FY 1966 onward and a self-financing ratio of 15%, commencing in FY1997. The financial ratios may be modified, if deemed necessary, upon completion of the National Water Tariff Policy Study	Schedule 6, para. 5	Complied with. Water tariff rates were revised, through decision no. 10/2000/QD-UB-DT, on 29 February 2000 (to adjust the water tariff), and decision no. 10/2912/QD-UB-DT (for additional rates to be collected and used for rehabilitation projects).

No.	Types of Consumer	D/m ³
1.	Domestic Use:	
	- < 4 m ³ /Man/Month	1,700
	- From 4 m ³ /Man/Month to 6 m ³ /Man/Month	2,500
	- From 6 m ³ /man/month to 10 m ³ /Man/Month	3,200
	- > 10 m ³ /Man/Month	
2.	Administrative Units:	
	- For < 1 m ³ /Man/Month	2,200
	- For > 1 m ³ /Man/Month	3,000
3.	Industrial Use	4,000
4.	Commercial Service Unit	6,500

Source: Ho Chi Minh City Water Supply Company.

Covenant	Reference in Loan Agreement	Status of Compliance
Billing Efficiency		
6. The Borrower and HCMCPC shall cause WSC to maintain its collection efficiency ratio of 60 days of annual sales or less.	Schedule 6, para. 6	Complied with. A recent collection efficiency ratio of 30 days of annual sales was recorded. Money collection achieved 84% for the end of 2000, 90% for the end of 2001, and 92% for 2002.
Unaccounted for Water		
7. The average unaccounted for water level of WSC shall be gradually reduced to at least 30% of treated water production by 31 December 1998.	Schedule 6, para. 7	Being complied with. UFW averaged 37.05% in 2001, 39.00% in 2002, and 35.00% in 2003. The Project Completion Mission found that achieving the 30% target is not possible, due to increased water pressure brought about by the Project's additional 120,000 m ³ per day, which caused many old pipes to burst. Of the 1,800 km distribution system, only 65 km were rehabilitated under the Project.
Depreciation Charges		
8. The WSC shall be fully exempted from requirements for annual depreciation funds remittance.	Schedule 6, para. 8	Complied with.
C. Other Matters		
Land Acquisition		
9. Land easement and any other rights in land required for the Project shall be made	Schedule 6, para. 9	Complied with.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>available on a timely basis. HCMCPC shall ensure that adequate compensation is provided to the affected people and that the communities involved in the relocation are consulted during the project design stage.</p>		
Saigon River Development Project		
<p>10. ADB shall be fully informed of the status and progress of the Saigon River Development Project that is being executed under the Italian Government assistance.</p>	Schedule 6, para. 10	Complied with.
Operation and Maintenance		
<p>11. The Borrower and HCMCPC shall ensure that sufficient resources are allocated on a timely basis, to ensure efficient operation and maintenance of project facilities.</p>	Schedule 6, para. 11	Complied with.
Community Participation		
<p>12. HCMCPC and WSC shall undertake a public information campaign with a view to educating the general public on proper use of water, health aspects of water use, water conservation, and prompt payment of water bills.</p>	Schedule 6, para. 12	Complied with. A public information campaign was completed on HCMC television.
Midterm Review		
<p>13. The Borrower and HCMCPC shall, in consultation with ADB, conduct a midterm review of the implementation of the Project, to assess the overall progress made and make appropriate adjustments in project design or implementation arrangements, as necessary.</p>	Schedule 6, para. 13	Complied with. A midterm review was conducted from 3 to 13 November 1998.
Benefit Monitoring and Evaluation		
<p>14. WSC shall carry out a BME program, using a format and systems as to be agreed upon with ADB, and submit to ADB the reports thereof in the English language.</p>	Schedule 6, para. 14	Complied with.
Environmental Considerations		
<p>15. In the design, construction, and operation and maintenance of project facilities, HCMCPC and WSC shall comply with applicable environmental laws and regulations of the Borrower and shall</p>	Schedule 6, para. 15	Complied with. An Environmental Impact Assessment report was prepared by the consultants.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>ensure that such problems as excavation, trenches, drainage, erosion, and damage to the natural environment receive due consideration. WSC shall minimize impacts on the discharge of filter wastewater, including sedimentation and tank sludge from water treatment plants. In the design of project facilities, HCMCPC and WSC shall adhere to ADB's <i>Environmental Guidelines for Infrastructure Projects</i>.</p> <p>The Borrower and HCMCPC shall take necessary measures to minimize contamination of water sources to be used by project facilities.</p>		
D. Project Agreement		
<p>16. HCMCPC and WSC shall furnish to ADB, through PMU, quarterly reports on the execution of the Project and on the operation and maintenance of project facilities.</p>	Project Agreement, section 2.08(b)	Complied with.
<p>Promptly after physical completion of the Project, but in any event not later than 3 months, HCMCPC and WSC shall prepare and furnish to ADB, through PMU, a report on the execution and initial operation of the Project, including cost, performance by HCMCPC and WSC of their respective obligations under the project agreement, and accomplishment of the purposes of the loan.</p>	Project Agreement, section 2.08	Complied with.
<p>17. HCMCPC and WSC shall (i) maintain separate accounts for the Project and for its overall operations; (ii) have such accounts and related financial statements audited annually; and (iii) furnish to ADB not later than 6 months after the close of the fiscal year to which they relate unaudited copies of such accounts and financial statements, and not later than 9 months after the close of the fiscal year to which they relate, certified copies of audited accounts and financial statements, all in the English language.</p>	Project Agreement, section 2.09	Complied with.

TECHNICAL ASSISTANCE COMPLETION REPORT

TA No. and Name TA 1998-VIE: National Water Tariff Policy Study		Amount Approved: \$600,000	
		Revised Amount: \$594,020	
Executing Agency: Ministry of Construction	Source of Funding: Japan Special Fund	TA Amount Undisbursed \$5,980	TA Amount Utilized \$594,020
Approval 29 Nov 1993	Signing 28 Sep 1994	Fielding of Consultants 6 Feb 1995	Completion Date Original Dec 1995 Actual May 1996
			Closing Date Original ¹ Actual 30 Apr 1998
Description			
<p>In the early 1990s, the Government introduced a policy of full cost recovery for the water supply sector. The Government also decentralized the authority for setting water tariffs to individual water supply companies (WSCs) throughout the country. The Government wished to develop a national water tariff policy that would take into account the financial viability of the individual WSCs as well as socioeconomic considerations, including affordability and willingness to pay of water consumers. The TA, which complemented Loan 1273-VIE: HCMC Water Supply and Sanitation Project, aimed to assist the Government in formulating a national water supply tariff policy that would be applicable to all water supply companies in the country but would recognize the differences that existed between various WSCs in terms of their institutional and financial capabilities.</p>			
Objectives and Scope			
<p>The objective was to (i) develop social and financial objectives for WSCs, taking into account financial viability of WSCs and socioeconomic considerations, including consumer affordability and willingness to pay; (ii) develop methodologies for the determination of water tariffs for WSCs, based upon the above objectives; and (iii) determine appropriate water tariffs for four selected WSCs (Hanoi, HCMC, Thanh Hoa, and Nha Trang), by employing the objectives and methodologies developed. The study consists of four components: (i) review of existing organizational framework, policies, and guidelines; (ii) survey representative WSCs; (iii) recommend social and financial objectives and tariff methodology; (iv) determine water tariff structure and levels in survey WSCs.</p>			
Evaluation of Inputs			
<p>The TA provided 30 person-months of consulting services, carried out by the New Zealand consultant, in association with the Australian consultant. The consultants commenced services in February 1995 and completed the assignment by May 1996. The TA objectives and scope were adequate and the terms of reference were clear and comprehensive. No significant modifications were made during the TA's implementation. The consultants reviewed the urban water supply sector background, existing institutional framework, existing tariff methodologies, and pilot town performance; identified the sector institutional policies and issues; prepared institutional options and recommendations on social, economic, and financial objectives for WSCs; introduced the concepts of modern water tariff formulation; compared the water tariffs in the region; and recommended tariff setting methodologies and their application in four pilot WSCs. The performance of the consultants was satisfactory.</p>			
Evaluation of Outputs			
<p>The TA provided a detailed assessment of urban water supply sector policies, institutional framework, existing tariff methodologies, and recent performance of pilot WSCs. The TA also introduced the concepts of modern water tariff formulation and developed a methodology for the determination of water tariffs for WSCs. The final report was submitted in June 1996, and its quality was satisfactory. The study's findings were discussed at two national seminars conducted in Hanoi and HCMC. The Management Board of Water Supply and Sanitation Development Projects, MOC submitted a summary of the report and results of the seminars to the relevant national and provincial agencies for review and comments. Two training courses were organized in Hanoi and HCMC on water tariff setting methodologies and financial issues in the water supply sector for financial and accounting staff members of the selected water companies. An interministerial circular on the setting of water tariffs, which adhered to the TA recommendations, was issued on 27 April 1997. Tariff adjustments for HCMC that adhered to the new policy recommended under the TA were put into effect in August 1996, and the tariffs were periodically reviewed and adjusted.</p>			

¹ No specific closing date.

Overall Assessment and Rating

The TA is rated as successful, as its objectives were substantially met.

Major Lessons Learned

Although the issuance of the Government's interministerial circular on the setting on water tariffs was a major step toward the establishment of a cost-recovery mechanism in the urban water supply sector and greater financial autonomy for WSCs, the implementation of the circular was slow, as responsibility for setting water tariffs belongs to the Provincial People's Committee in each province. For governments in transition from centrally planned to market-oriented economies, new regulations such as the water tariff adjustments take time to be implemented effectively.

Recommendations and Follow-Up Actions

The slow adoption of the tariff recommendations by the provinces and the lengthy domestic processes required to establish or adjust a tariff inhibit the achievement of full benefits. Constant and continuous efforts in pushing the tariff reforms under other ADB's interventions and coordination with other development agencies are important in achieving the broader impact of the TA.

Source: Report prepared by Yong Ye, Project Economist, Social Sectors Division, Mekong Regional Department.

TECHNICAL ASSISTANCE COMPLETION REPORT

TA No. and Name TA 1999-VIE: Institutional Strengthening of HCMC Water Supply Company			Amount Approved: \$600,000																
			Revised Amount: \$563,235																
Executing Agency: HCMC Water Supply Company (WSC)		Source of Funding: Technical Assistance Special Fund	TA Amount Undisbursed \$36,765	TA Amount Utilized \$563,235															
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Date</th> <th colspan="2" style="text-align: center;">Completion Date</th> </tr> <tr> <th style="text-align: center;">Approval</th> <th style="text-align: center;">Signing</th> <th style="text-align: center;">Fielding of Consultants</th> <th style="text-align: center;">Original</th> <th style="text-align: center;">Actual</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">29 Nov 1993</td> <td style="text-align: center;">28 Sep 1994</td> <td style="text-align: center;">9 Apr 1995</td> <td style="text-align: center;">31 Dec 1998</td> <td style="text-align: center;">15 Mar 1999</td> </tr> </tbody> </table>			Date			Completion Date		Approval	Signing	Fielding of Consultants	Original	Actual	29 Nov 1993	28 Sep 1994	9 Apr 1995	31 Dec 1998	15 Mar 1999	Closing Date	
			Date			Completion Date													
Approval	Signing	Fielding of Consultants	Original	Actual															
29 Nov 1993	28 Sep 1994	9 Apr 1995	31 Dec 1998	15 Mar 1999															
			Original ²	Actual 31 May 2000															
Description																			
<p>The TA is attached to Loan 1273-VIE: HCMC Water Supply and Sanitation Project. During loan appraisal, the Government requested ADB to provide institutional strengthening assistance, to improve the efficiency and effectiveness of the Ho Chi Minh City Water Supply Company (HCMC WSC), particularly in the areas of management, billing, accounting and financial management, and planning, as the country was increasingly moving toward a more decentralized and market-oriented economy. The hardware components of the assistance were included as part of loan project. The technical assistance (TA), which complemented the loan project, covered mainly the software components.</p>																			
Objectives and Scope																			
<p>The objective of the TA was to provide the institutional strengthening necessary to ensure the long-term financial and technical viability of the HCMC WSC. The TA consisted of three components (Part A: Training Program Development, Part B: Management Information Systems Development, and Part C: Computer Systems Development).</p>																			
Evaluation of Inputs																			
<p>The TA provided 29.5 person-months of consulting services, carried out by a team of individual consultants comprising a training specialist, two financial management specialists, and one computer system specialist.</p>																			
<p>Part A: The consultant provided 8 person-months of services, starting in May 1995 and ending in 18 March 1996. The consultant assessed existing training levels at WSC and the overall institutional capability of WSC, identified and assessed the training needs of WSC staff members, developed programs for staff member training and development, prepared an outline curriculum for each program, and helped implement the overseas training program. The consultant also made recommendations on the organization arrangements, supporting policies and guidelines and instructor development, physical resources development, and further consulting services, to successfully implement the staff member training and development program and sustain the training initiatives and benefits.</p>																			
<p>Part B: The component was divided into three phases, to facilitate the successful implementation of the recommendations and allow for a certain level of coordination between the MIS and computer system development component. The first phase was carried out by an individual consultant from April to November 1995. The consultant provided 7 person-months of services and reviewed existing accounting and MIS systems and the organizational structure and staffing of WSC; prepared recommendations for modifications to accounting and MIS systems; developed a series of spreadsheet-based models, for use by WSC staff members in preparing annual budgets; assisted in the implementation of a modified chart of accounts; developed a basic plan for an accounting system for the PMU; and prepared a basic format for the benefit monitoring and evaluation (BME) system. The second phase was undertaken by the same consultant from January to June 1996. The consultant provided 5.5 person-months of services and prepared an outline for an accounting manual, developed a system and associated model for the formulation of the annual WSC budgets, and prepared a framework for corporate planning and a framework for the establishment of an internal audit function within WSC. The consultant also developed further the BME system. During the third phase, about 2 person-months of services were provided by another individual consultant, from March to June 1997. The consultant reviewed the findings and recommendations made under the first two phases, assessed their adequacy in meeting the financial management and reporting requirements of WSC, and prepared a guideline on accounting and MIS requirements for developing the MIS system for WSC.</p>																			

² No specific closing date.

Part C: The consultant provided about 7 person-months of services, starting in May 1996 and ending in July 1997. The consultant helped modify the billing software, assessed the immediate and long-term computer needs of WSC and developed a software and hardware plan for meeting these needs, made recommendations on the institutional setup for IT services and management in WSC, and prepared a functional description of a proposed IT division. The consultant also prepared configuration specifications for bidding documents and assisted in bid evaluation and acceptance tests for computer systems procured under Loan 1273-VIE.

Evaluation of Outputs

Part A: The final report of the component was submitted in March 1996. The quality of the report was satisfactory. Based on the consultant's assessment, four programs for staff training and development were prepared (in-house training program, local external training program, overseas training program, and staff scholarship program) that addressed the priority needs of personnel at all hierarchical levels. A total of 50 courses were designed for in-house and local training programs in areas of corporate planning, organization development, water supply maintenance and management, financial management and accounting, computer systems, and English. A total of 100 staff members were trained as trainers and 33 staff members received short-term training under the TA at the Metropolitan Waterworks Authority in Bangkok. Following the TA recommendations, a training services section was established within WSC to undertake training activities. Most training programs recommended by the TA were implemented using loan funds.

Part B: The final report of the component was submitted in January 1999. The TA developed a BME system for the loan project and prepared a framework that strengthened the billing, accounting, and financial management capacity of WSC. A guideline on accounting and MIS requirements and specifications was also developed, to guide computer hardware and software procurement under the loan project. The procured MIS software is now working satisfactorily.

Part C: The TA developed a software and hardware development plan for WSC, based on the assessment of the immediate and long-term computer needs of WSC. Following the plan, the immediately needed computer systems were procured and installed under the loan project, with the help of the TA consultant. An IT division was also established within WSC, to look after the IT services and system maintenance, following the institutional setup recommendations of the TA.

The TA, as a whole, has contributed to the significant improvement of the efficiency and overall performance of WSC.

Overall Assessment and Rating

The TA is rated as successful, as it achieved its intended purpose.

Major Lessons Learned

One effect of having the components carried out by individual consultants, rather than by a single firm, was that little coordination existed among consultants and therefore among components. A company would be more appropriate for this type of assignment.

Recommendations and Follow-Up Actions

The BME system focused mainly on physical and financial aspects and could be strengthened by developing more meaningful and measurable performance indicators, particularly on economic and social aspects.

For future TA with several interrelated components that are carried out by individual consultants, a strong team leader should be appointed, preferably throughout the TA implementation period, to ensure close coordination of the consultants' work.

Source: Report prepared by Yong Ye, Project Economist, Social Sectors Division, Mekong Regional Department.

TECHNICAL ASSISTANCE COMPLETION REPORT

TA No. and Name TA 2000-VIE: HCMC Water Supply Master Plan			Amount Approved: \$600,000	
			Revised Amount: \$589,566	
Executing Agency: Department of Communications, Transport and Public Works		Source of Funding: Japan Special Fund		TA Amount Undisbursed \$10,434
				TA Amount Utilized \$589,566
Approval	Signing	Fielding of Consultants	Original	Completion Date Actual
29 Nov 1993	28 Sep 1994	6 Feb 1995	28 Feb 1996	28 May 1996
			Original³	Closing Date Actual
				31 Jul 1996
Description				
<p>The Government's two-stage sector development plan gave top priority in 1993 to the urgently required rehabilitation works for water supply and sanitation systems in the country's three largest urban centers, with an emphasis on the development of a master plan for each of the cities and an institutional development program, to improve sector management and operation and maintenance capabilities. ADB provided a loan project (Loan 1273-VIE) to carry out urgent rehabilitation of the water supply and sanitation system in Ho Chi Minh City (HCMC). However, to satisfy future demand, a comprehensive study was needed to identify new water supply sources and develop a least-cost water supply development program. The technical assistance (TA) complementing Loan 1273-VIE aimed to help city authorities plan and carry out future water supply development projects in an orderly and cohesive manner, by developing a master plan for water supply services in HCMC up to 2015.</p>				
Objectives and Scope				
<p>The objective of the TA is to assist the Government in the development of a master plan for water supply services in HCMC, to improve health and the urban environment. The TA will review and consolidate previous and ongoing studies in the water supply sector, assess and prioritize the needs for future development, identify specific investment projects within the sector, and prepare a medium-term development program (up to 2005) and a long-term development program (up to 2015). The TA will also develop the capabilities and enhance the experience among counterpart staff in the fields of water supply and sanitation and urban planning.</p>				
Evaluation of Inputs				
<p>The TA provided 21.77 person-months of services from February 1995 to February 1996. The TA objectives and scope were adequate, and the terms of reference were clear and comprehensive. The consultants undertook detailed studies on the conditions and shortcomings of the existing system; projected future water demand; and examined alternative water sources, treatment options, distribution network alignments, and investments phasing, to meet the demand. The consultants also examined the institutional and environmental protection requirements for implement a master plan. The performance of the consultants was satisfactory. The Executing Agency (EA) appointed counterpart staff members to work with the consultants and played an active role in providing the needed logistical support. Communication and coordination among the consultants, EA, and ADB were smooth. ADB fielded 3 review missions during the TA's implementation.</p>				
Evaluation of Outputs				
<p>The final report was submitted in May 1996. The report was well prepared and thoroughly documented. The TA developed a master plan for water supply development in HCMC that included one medium-term and one long-term development program. The institutional improvement and environmental protection considerations needed to effectively implement a master plan were also recommended. The ability to prepare medium-term plans was satisfactorily transferred to the HCMC government. The medium-term development program developed by the TA formed the basis for a revised and updated water supply development plan to 2005 for HCMC, which was approved by the Prime Minister in 2000. The long-term plan was subsumed in the long-term water supply plan of the HCMC government.</p>				
Overall Assessment and Rating				
<p>The TA is rated as successful, as its objectives were substantially met.</p>				

³ No specific closing date.

Major Lessons Learned

The TA helped transfer the ability to prepare medium-term plans to the HCMC government. However, the continuity of the ability will depend on the continuous commitment of the HCMC government. Many of those staff members who received training under the TA were given other assignments or resigned from the Department of Communications, Transport, and Public Works, which weakened this ability.

Recommendations and Follow-Up Actions

The Government should to keep the Master Plan updated and used it as a basis for decisions on capital investments, to match future demand for water facilities.

Source: Report prepared by Yong Ye, Project Economist, Social Sectors Division, Mekong Regional Department.

ECONOMIC ANALYSIS

A. General

1. No quantitative economic analysis was undertaken at appraisal. To assess the economic efficiency of the Project at completion, an economic analysis was carried out following the Asian Development Bank's (ADB's) *Guidelines for the Economic Analysis of Projects* (1997) and *Guidelines for the Economic Analysis of Water Supply Projects* (1998). The economic analysis was conducted for a period of 30 years, with no salvage value assumed thereafter.

B. Project Scenarios

2. The without project scenario was rebuilt based on historical records, Water Supply Company (WSC) and project management unit (PMU) discussions, and field visits and the survey done by the Project Completion Report (PCR) Mission. The without project scenario assumed that (i) water production capacity would have been reduced by 14,400 cubic meters (m^3) per day, which would have been lost in 1998, without rehabilitation under the Hoc Mon Wellfield Development component; (ii) unaccounted for water (UFW) would have remained at the level in 1993, although UFW tends to increase over the years, due to the aging of the system and inadequate maintenance; and (iii) drainage and sanitation conditions around the Rach Bung Binh area would have remained unchanged. The with project scenario was derived from the project reality at completion. With the Project, water production capacity increased by 100,000 m^3 per day, UFW was maintained at 35%, and drainage and sanitation conditions improvement enabled significant economic development in Rach Bung Binh area.

C. Costs

3. The capital costs and incremental operation and maintenance (O&M) costs were considered. The unit O&M costs for without and with project scenarios were estimated using the O&M costs before and after the Project. All costs are expressed in constant 1993 prices. To convert the financial costs to the economic costs, taxes and duties as well as loan service charges were discounted, as appropriate. Tradable components were adjusted using a shadow exchange rate factor¹ and not tradable components were valued at domestic market prices. A shadow wage rate factor for unskilled labor was used to reflect its opportunity costs in the context of a wide availability of labor in Viet Nam.²

D. Benefits

4. The Project increased WSC water production capacity by 100,000 m^3 per day, reduced UFW from 42% to 35%, and improved the drainage and sanitation conditions in the Rach Bung Binh area. As a result, in 2003, the Project enabled incremental water supply of about 134,000 m^3 per day to (i) 100,000 households, via house connections; (ii) 6,000 households, via water selling points; and (iii) other nondomestic users.³ The major economic benefits generated from the Project are (i) cost savings and benefits associated with increased water supply; (ii) energy consumption and maintenance expenditure reductions; and (iii) land value increases, due to the rehabilitation of the drainage and sewerage canal in Rach Bung Binh and construction of a service road associated with the raw water transmission line.

¹ The shadow exchange rate factor is estimated at 1.11

² The shadow wage rate factor is estimated at 0.65.

³ Compared with the without project scenario.

5. Quantifiable economic benefits of additional water supply resulted from nonincremental and incremental water supply. For domestic users, nonincremental water supply was valued at the existing average supply price from nonpiped sources, which was about D4,700 per m³, and incremental water supply was valued at an average demand price of about D3,600 per m³. The volumes of nonincremental and incremental water supply for domestic users were estimated based on the socioeconomic survey done at appraisal and the Project's benefit monitoring and evaluation reports. For nondomestic users, due to the difficulties in identifying nonincremental and incremental water usage and supply costs for nonincremental water without the Project, water supply for nondomestic users was valued at its current selling price, which is normally lower than the supply price for nonincremental water and the demand price for incremental water. Moreover, the socioeconomic survey at appraisal and the survey completed by the PCR Mission showed that households without piped connections were equipped with water storage facilities, such as water tanks and jars, and had to spend about half an hour daily fetching water from other sources. The around-the-clock stable water supply service provided by the Project enabled households to remove water storage facilities and save time once used to fetch water. The benefits from water transportation and storage cost savings and time savings were estimated at D398,000 per household per year and D395,000 per household per year, respectively.

6. The benefits associated with reduced energy consumption and maintenance expenditures were already captured in the lower O&M costs, and therefore were not listed as a separate benefit stream in the Project's benefits calculation.

7. The rehabilitation of the drainage and sewerage canal in Rach Bung Binh and construction of a service road for the raw water transmission line helped raise economic activities in adjacent areas. The survey completed by the PCR Mission showed that land values within 20 meters of the project sites increased dramatically, by 3.5–5.0 times in the case of the raw water transmission line and 10.0–15.0 times in the Rach Bung Binh area. The details used in calculating the land value increase benefits are summarized in Table A9.1.

Table A9.1: Land Value Increase Resulting from the Project

Location	Land Area (ha)	Land Value (D '000 per m ³ , 1993 price level)	
		Without Project	With Project
Along Raw Water Transmission Line	21.6	590	1300
Rach Bung Binh	2.6	470	2400

Ha = hectare, m³ = cubic meter.

Source: field surveys.

E. Results of the Economic Analysis

8. The results of the economic analysis are summarized in Table A9.2 and Table A9.3. The Economic Internal Rate of Return (EIRR) of the Project is 16.4%, higher than the economic opportunity cost of capital in Vietnam, which is estimated at 12.0%. The net present value is about D173.0 billion. The sensitivity analysis shows that the EIRR is more vulnerable to the benefits reduction, and a 10.0% reduction in project benefits will reduce the EIRR to 14.5%. The calculated switching values are 236.4% for O&M cost increase and 22.6% for benefits decrease, which are beyond the plausible ranges of variability of the tested variables.

Table A9.2: Results of the Economic Analysis

Item	Base Case	Sensitivity Tests	
		O&M Costs + 10%	Benefits – 10%
EIRR (%)	16.4	16.2	14.5
NPV (D billion)	173.0	165.7	96.6
SI		0.4	4.4
SV (%)		236.4	22.6

D = dong, EIRR = economic internal rate of return, NPV = net present value, O&M = operation and maintenance, SI = sensitivity indicator, SV = switching values.

Source: staff estimates.

Table A9.3: Summary of Economic Internal Rate of Return
(D billion)

Year	Economic Cost		Gross Economic Benefits					Net Economic Benefits
	Capital	O&M	Water Collecting and Storing Cost Savings	Substituting Nonincremental Water Supply	Incremental Water Supply	Land Value Increase	Total	
1996	58.4	0.0	0.0	0.0	0.0	0.0	0.0	-58.4
1997	60.8	0.0	0.0	0.0	0.0	0.0	0.0	-60.8
1998	75.4	4.3	0.3	10.5	1.5	0.0	12.3	-67.5
1999	192.6	4.3	0.3	10.5	1.4	0.0	12.2	-184.7
2000	271.0	4.3	0.3	10.1	1.4	0.0	11.8	-263.6
2001	76.2	4.3	0.3	9.7	1.3	0.0	11.3	-69.2
2002	29.2	34.3	3.1	98.4	13.6	212.3	327.5	264.1
2003	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2004	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2005	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2006	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2007	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2008	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2009	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2010	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2011	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2012	196.2	13.5	4.5	143.2	19.9	0.6	168.2	-41.5
2013	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2014	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2015	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2016	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2017	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2018	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2019	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2020	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2021	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2022	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2023	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
2024	196.2	13.5	4.5	143.2	19.9	0.6	168.2	-41.5
2025	0.0	13.5	4.5	143.2	19.9	0.6	168.2	154.7
NPV	518.2	73.2	18.0	569.2	78.9	98.3	764.4	173.0
EIRR								16.4%

EIRR = economic internal rate of return, NPV = net present value, O&M = operation and maintenance.

Source: staff estimates

FINANCIAL ANALYSIS AND PROJECTIONS

A. General

1. A financial analysis was conducted to determine the financial viability and sustainability of the water supply component of the Project at completion, following the *Guidelines for Financial Governance and Management of Investment Project Financed by the Asian Development Bank*. The analysis comprises two parts: (i) project financial analysis for water supply component, which aims to calculate a financial internal rate of return (FIRR) for the Project; and (ii) assessment of financial performance of the Water Supply Company (WSC).

B. Major Assumptions

2. The project financial analysis applies only to the incremental investment made and benefits achieved under the Project and not to the WSC's entire operations. The analysis was based on the same with and without project scenarios described in the economic analysis (Appendix 9). The major assumptions applied in the project financial analysis are (i) the analysis is conducted over a 25-year period, from 1995 to 2019; (ii) the project induced incremental revenues and costs are expressed in Vietnamese dong, in constant 1993 prices; (iii) the costs, including capital, operation and maintenance (O&M), and replacement costs, are recorded in the year they are incurred; and (iv) the equipment components will have a life of 12 years, with 20% residual value, and civil works will have a life of 40 years, with no residual value.

3. The financial performance assessment was based on the audited financial reports of WSC, from 1996 to 2002. A cash flow projection was made to assess the future financial performance of WSC. The major assumptions employed in the WSC cash flow projection are (i) the projection covers the WSC's entire operations over the 2003–2007 forecast period; (ii) the projected cash inflows and outflows are presented in Vietnamese dong and expressed in current prices; and (iii) the loan proceeds onlent to WSC will carry a maturity of 25 years, with a grace period of 5 years, and an interest rate of 6.5%.

C. Water Tariff

4. At appraisal, the average water tariffs were: (i) D1,000 per cubic meter for domestic and government users, (ii) D2,500 per cubic meter for industrial users, and (iii) D4,700 for commercial users. During project implementation the average water tariffs increased annually at a real rate of 2%. The average water tariffs at completion, in 2003, were (i) D2,500 per cubic meter for domestic and government users, (ii) D4,000 per cubic meter for industrial users, and (iii) D6,500 for commercial users. All are higher than the appraisal projections. The Ho Chi Minh City People's Committee (HCMCPC) decided to increase in 2004 the water tariffs further, to (i) D2,700 per cubic meter for domestic and government users, (ii) D6,000 per cubic meter for industrial users, and (iii) D9,000 for commercial users.

D. Project Financial Analysis

5. The results of the project financial analysis for the water supply component are presented in Table A10.1 and Table A10.6. The FIRR for the water supply component is 7.0%, which is significantly lower than the appraisal estimate of 13.5% but still above the estimated Weighted Average Cost of Capital (WACC) of 4.0%. The lower FIRR is due mainly to the (i) long delay in project implementation; (ii) increased electricity consumption in the distribution system, resulting from higher water pressure; and (iii) higher-than-expected unaccounted for water (UFW) rate. The UFW rate in 2003 was about 35%, while 30% was estimated at appraisal. The sensitivity analysis indicates that the FIRR is more vulnerable to

a decrease in revenues than an increase in O&M costs, and a 10% decrease in revenues will reduce the FIRR to 5.8%. The calculated switching values are 151.6% for O&M cost increase and 24.7% for revenue decrease, which are beyond the plausible ranges of variability of the tested variables.

Table A10.1: Results of the Project Financial Analysis

Item	Base Case	Sensitivity Tests	
		O&M Costs + 10%	Benefits – 10%
FIRR (%)	7.0	6.8	5.8
NPV at WACC	280.4	261.9	167.0
SI		0.7	4.0
SV (%)		151.6	24.7

FIRR = financial internal rate of return, NPV = Net Present Value, O&M = operation and maintenance, SI = sensitivity indicator, SV = switching value, WACC = weighted average cost of capital.

Source: staff estimates.

E. Assessment of Financial Performance the Water Supply Company

6. The WSC has shown positive net income, ranging from D12.5 billion to D 50.4 billion, since 1996. The company recorded a net income of D40 billion in 2002. The significant reduction in net income in 2000 was due mainly to the fact that the company bought about 15,000,000 m³ of treated water from the Binh An build-operate-transfer project at a price of about D3,000 per m³, which was higher than the WSC's selling price. The returns on assets ranged from 1.3% to 7.1%, and the returns on equity range from 2.0% to 9.0%, during the assessment period. Table A10.2 summarizes the income statement of the WSC.

Table A10.2: Summary of Income Statements
(D million)

Item	1996	1997	1998	1999	2000	2001	2002
Gross Turnover	280,025	289,818	298,666	306,705	481,157	540,949	602,362
Deductions	3,191	3,438	3,717	124	56	97	37
- Sold Goods to be Returned	75	124	205	124	56	97	37
- Turnover Tax	3,116	3,315	3,512	-	-	-	-
1. Net Turnover	276,834	286,379	294,949	306,581	481,101	540,852	602,325
2. Cost of Sales	225,217	231,470	229,522	243,722	450,391	496,757	542,042
3. Gross Profit	51,617	54,908	65,427	62,859	30,710	44,095	60,283
4. Selling Expenses	-	274	113	70	259	78	94
5. Administration Expenses	13,574	16,752	20,982	22,315	21,930	24,840	22,569
6. Net Income	38,044	37,883	44,332	40,474	8,521	19,177	37,620
- Financial Income	14,888	15,640	27,908	34,266	10,072	13,795	16,463
- Financial Expenses	49	-	-	121	-	-	45
7. Net Financial Income	14,838	15,640	27,908	34,144	10,072	13,795	16,418
- Contingency Income	4,464	697	2,727	11,540	8,108	26,582	7,408
- Contingency Expenses	4,113	487	1,977	7,874	8,279	9,756	2,397
8. Net Contingency Income	350	210	750	3,666	(171)	16,827	5,011
9. Total Income Before Tax	53,232	53,732	72,991	78,285	18,423	49,798	59,049
10. Capital Using Charge	-	7,734	-	-	-	-	-
11. Loss on Business Combination	-	-	-	-	-	1,499	-
12. Income Tax Payable	13,445	15,823	22,549	25,051	5,895	15,456	18,896
13. Income After Tax	39,787	30,175	50,442	53,234	12,528	32,844	40,153
Return on Assets	7.0%	5.3%	6.7%	7.1%	1.3%	3.3%	3.7%
Return on Equity	8.3%	6.3%	9.0%	9.5%	2.0%	5.3%	5.8%

Source: audited financial reports of Ho Chi Minh City Water Supply Company and staff estimates.

7. The WSC's balance sheet shows the WSC's good liquidity status, the company maintained current ratios (current assets to current liabilities) ranging from 4.25 to 8.19 from 1996 to 2001. Although the current ratio fell to 1.27 in 2002, this was due to a sharp increase in other payments under the short-term liability, to finance the long-term investment. The company should therefore seriously consider substituting the short-term liability with the long-term liability, to improve the company's liquidity status. The long-term debt-equity ratios range from 0.17 to 0.73. A summary of the balance sheet is in Table A10.3.

Table A10.3: Summary of Balance Sheets
(D million)

Item	1996	1997	1998	1999	2000	2001	2002
Assets							
A. Current Assets	421,298	514,032	666,804	693,064	745,706	1,001,768	1,123,862
1. Cash	269,608	319,123	395,353	372,346	426,853	366,748	375,194
2. Accounts Receivable	50,622	66,831	99,758	125,004	109,509	368,466	330,931
3. Inventories	97,125	90,979	154,211	187,480	207,378	261,898	411,328
4. Other Current Assets	3,943	37,098	17,482	8,235	1,966	4,656	6,409
B. Fixed Assets	149,149	233,415	330,897	397,122	1,507,970	1,882,973	2,587,453
1. Fixed Assets	106,236	121,201	179,195	154,909	973,551	878,358	1,357,079
2. Long-Term Investment	-	-	-	-	5,000	5,000	6,146
3. Cost of Construction in Progress	42,913	112,215	151,702	242,213	529,419	999,611	1,230,375
4. Long-Term Deposit	-	-	-	-	-	4	4
Total Assets	570,447	747,447	997,701	1,090,187	2,253,676	2,884,742	3,711,316
Resources							
A. Liabilities	93,336	187,335	376,452	403,317	635,082	826,128	1,568,373
1. Short-Term Liabilities	56,688	62,797	105,766	89,841	171,204	235,539	884,737
2. Other Liabilities	36,648	124,537	270,686	313,476	463,878	590,590	683,637
B. Owner's Equity	477,111	560,112	621,249	686,869	1,618,594	2,058,613	2,149,092
Total Resources	570,447	747,447	997,701	1,090,187	2,253,676	2,884,742	3,717,466
Current Ratio	7.43	8.19	6.30	7.71	4.36	4.25	1.27
Long-Term Debt-Equity Ratio	0.17	0.46	0.72	0.73	0.34	0.41	0.44

Source: audited financial reports of Ho Chi Minh City Water Supply Company and staff estimates.

8. WSC recorded net cash inflow from 1996 to 1998 but experienced a negative cash flow from 1999 to 2002. The major reasons for the negative cash flow are (i) purchase of the treated water from Binh An build-operate-transfer project at a price higher than WSC's selling price, which reduced the cash inflow from operating activities, and (ii) capital investment in the Project. Nevertheless, the company still had a cash-cash equivalent accumulation of D405 billion at the end of 2002. The self-financing ratio in the past 5 years ranged from 11% to 36%, all higher than 15%, except for 1999 and 2001. Table A10.4 summarizes the WSC's cash flow statements. The negative cash flows in the past 4 years and reducing trend of the self-financing ratio indicate needs to increase cash inflows, particularly through internal cash generation. The HCMC PC noted the needs and decided to increase water tariffs starting in 2004. With the adjustment in water tariffs, the cash flow conditions of the company are expected to improve. The projections show that the WSC's operation is financially sustainable, the cash flows generated are sufficient to meet all operating costs and depreciation and debt service requirements, and the company will have net cash inflows from 2003 to 2007. The debt service coverage ratios are in a range of 7–9. Assuming the company will make an average annual investment of D465 billion from 2003 to 2007, the projected self-financing ratios will stand at around 40%. Table A10.5 summarizes the cash flow projections for WSC.

Table A10.4: Summary of Cash Flow Statement
(D million)

Item	1996	1997	1998	1999	2000	2001	2002
A. Cash Flows from Operating Activities							
1. Cash Received from Customers	316,208	404,175	432,928	416,063	537,585	581,357	633,881
2. Other Receipts	5,043	25,539	37,994	24,350	29,214	21,800	118,527
3. Cash Paid to Suppliers	57,767	70,209	157,043	101,394	216,422	268,560	338,788
4. Payments to Employees	35,455	49,821	40,668	61,409	62,535	63,135	68,409
5. Tax Paid to Government	51,207	136,784	127,922	120,110	64,764	30,661	70,884
6. Other Payments	97,434	134,952	27,355	178,199	171,777	226,232	225,830
Net Cash Inflows from Operating Activities	79,388	37,948	117,933	(20,698)	51,300	14,568	48,497
B. Cash Flows From Investing Activities							
1. Proceeds from Sales of Fixed Assets	-	145	256	545	6	871	-
2. Purchases of Fixed Assets	17,739	92,612	217,900	114,937	289,351	220,961	251,607
Net Cash Outflows from Investing Activities	(17,739)	(92,467)	(217,644)	(114,392)	(289,346)	(220,090)	(251,607)
C. Cash Flows from Financing Activities							
1. Interest Earning	12,263	15,135	20,378	22,601	9,585	13,441	22,974
2. Other Earning	15,044	87,722	158,902	80,833	200,531	176,946	168,527
3. Principal Repayments	-	-	-	-	-	30,630	-
4. Other Payments	-	-	-	-	-	-	-
Net Cash Inflows from Financing Activities	27,307	102,857	179,280	103,434	210,116	159,757	191,502
Net Increase in Cash and Cash Equivalent	88,956	48,339	79,569	(31,656)	(27,929)	(45,765)	(11,608)
Opening Cash and Cash Equivalent	180,137	269,093	317,432	397,001	365,346	462,582	416,817
Closing Cash and Cash Equivalent	269,093	317,432	397,001	365,346	462,582	416,817	405,209
Self Financing Ratio (5-year average)	36%	22%	19%	11%	15%	13%	19%
Debt Service Coverage Ratio	N.A.	N.A.	N.A.	N.A.	N.A.	0.48	0.48
Collection Efficiency	96%	99%	100%	102%	97%	97%	99%

Source: audited financial reports of Ho Chi Minh City Water Supply Company and staff estimates.

Table A10.5 Cash Flow Projection for the Water Supply Company
(D million)

Item	2002	2003	2004	2005	2006	2007
A. Cash Flows From Operating Activities						
1. Cash Received from Customers	633,881	673,186	804,379	870,801	931,231	982,319
2. Other Receipts	118,527	125,698	133,303	141,367	149,920	158,990
3. Cash Paid to Suppliers	338,788	320,464	344,161	361,369	379,438	398,409
4. Payments to Employees	68,409	72,290	76,088	79,893	83,888	88,082
5. Tax Paid to Government	70,884	33,659	46,562	57,912	66,395	75,833
6. Other Payments	225,830	238,251	251,354	265,179	279,764	295,151
Net Cash Inflows from Operating Activities	48,497	134,220	219,515	247,816	271,666	283,834
B. Cash Flows From Investing Activities						
1. Proceeds from Sales of Fixed Assets	-	-	-	-	-	-
2. Purchases of Fixed Assets	251,607	465,000	512,663	565,210	623,144	687,017
Net Cash Outflows from Investing Activities	(251,607)	(465,000)	(512,663)	(565,210)	(623,144)	(687,017)
C. Cash Flows From Financing Activities						
1. Interest Earning	22,974	21,475	(33,486)	(29,269)	(22,581)	(21,791)
2. Other Earning	168,527	348,750	384,497	423,908	467,358	515,263
3. Principal Repayments	-	-	31,139	31,139	31,139	31,139

Table A10.4: Summary of Cash Flow Statement
(D million)

Item	1996	1997	1998	1999	2000	2001	2002
A. Cash Flows from Operating Activities							
1. Cash Received from Customers	316,208	404,175	432,928	416,063	537,585	581,357	633,881
2. Other Receipts	5,043	25,539	37,994	24,350	29,214	21,800	118,527
3. Cash Paid to Suppliers	57,767	70,209	157,043	101,394	216,422	268,560	338,788
4. Payments to Employees	35,455	49,821	40,668	61,409	62,535	63,135	68,409
5. Tax Paid to Government	51,207	136,784	127,922	120,110	64,764	30,661	70,884
6. Other Payments	97,434	134,952	27,355	178,199	171,777	226,232	225,830
Net Cash Inflows from Operating Activities	79,388	37,948	117,933	(20,698)	51,300	14,568	48,497
B. Cash Flows From Investing Activities							
1. Proceeds from Sales of Fixed Assets	-	145	256	545	6	871	-
2. Purchases of Fixed Assets	17,739	92,612	217,900	114,937	289,351	220,961	251,607
Net Cash Outflows from Investing Activities	(17,739)	(92,467)	(217,644)	(114,392)	(289,346)	(220,090)	(251,607)
C. Cash Flows from Financing Activities							
1. Interest Earning	12,263	15,135	20,378	22,601	9,585	13,441	22,974
2. Other Earning	15,044	87,722	158,902	80,833	200,531	176,946	168,527
3. Principal Repayments	-	-	-	-	-	30,630	-
4. Other Payments	-	-	-	-	-	-	-
Net Cash Inflows from Financing Activities	27,307	102,857	179,280	103,434	210,116	159,757	191,502
Net Increase in Cash and Cash Equivalent	88,956	48,339	79,569	(31,656)	(27,929)	(45,765)	(11,608)
Opening Cash and Cash Equivalent	180,137	269,093	317,432	397,001	365,346	462,582	416,817
Closing Cash and Cash Equivalent	269,093	317,432	397,001	365,346	462,582	416,817	405,209
Self Financing Ratio (5-year average)	36%	22%	19%	11%	15%	13%	19%
Debt Service Coverage Ratio	N.A.	N.A.	N.A.	N.A.	N.A.	0.48	0.48
Collection Efficiency	96%	99%	100%	102%	97%	97%	99%

Source: audited financial reports of Ho Chi Minh City Water Supply Company and staff estimates.

Table A10.5 Cash Flow Projection for the Water Supply Company
(D million)

Item	2002	2003	2004	2005	2006	2007
A. Cash Flows From Operating Activities						
1. Cash Received from Customers	633,881	673,186	804,379	870,801	931,231	982,319
2. Other Receipts	118,527	125,698	133,303	141,367	149,920	158,990
3. Cash Paid to Suppliers	338,788	320,464	344,161	361,369	379,438	398,409
4. Payments to Employees	68,409	72,290	76,088	79,893	83,888	88,082
5. Tax Paid to Government	70,884	33,659	46,562	57,912	66,395	75,833
6. Other Payments	225,830	238,251	251,354	265,179	279,764	295,151
Net Cash Inflows from Operating Activities	48,497	134,220	219,515	247,816	271,666	283,834
B. Cash Flows From Investing Activities						
1. Proceeds from Sales of Fixed Assets	-	-	-	-	-	-
2. Purchases of Fixed Assets	251,607	465,000	512,663	565,210	623,144	687,017

Net Cash Outflows from Investing Activities	(251,607)	(465,000)	(512,663)	(565,210)	(623,144)	(687,017)
C. Cash Flows From Financing Activities						
1. Interest Earning	22,974	21,475	(33,486)	(29,269)	(22,581)	(21,791)
2. Other Earning	168,527	348,750	384,497	423,908	467,358	515,263
3. Principal Repayments	-	-	31,139	31,139	31,139	31,139
4. Other Payments	-	-	-	-	-	-
Net Cash Inflows from Financing Activities	191,502	370,225	319,872	363,500	413,639	462,332
Net Increase in Cash and Cash Equivalent	(11,608)	39,445	26,725	46,105	62,161	59,150
Opening Cash and Cash Equivalent	416,817	269,093	317,432	397,001	365,346	462,582
Closing Cash and cash Equivalent	405,209	308,538	344,157	443,107	427,506	521,732
Self-Financing Ratio (5 years average)	38%	41%	43%	43%	42%	41%
Debt Service Coverage Ratio	N.A.	N.A.	7.05	7.96	8.72	9.12

Source: staff estimates .

Table A10.6 Summary of Financial Internal Rate of Return Calculation
(D billion)

Year	Financial Cost		Revenue	Net Revenue
	Capital	O&M		
1996	58.3	0.0	0.0	-58.3
1997	60.7	0.0	0.0	-60.7
1998	87.5	4.7	12.2	-80.0
1999	217.6	4.7	7.6	-214.7
2000	308.4	4.7	7.4	-305.8
2001	87.5	4.7	7.1	-85.1
2002	32.5	37.2	109.8	40.1
2003	0.0	14.7	123.8	109.1
2004	0.0	14.7	104.8	90.1
2005	0.0	14.7	104.8	90.1
2006	0.0	14.7	104.8	90.1
2007	0.0	14.7	104.8	90.1
2008	0.0	14.7	104.8	90.1
2009	0.0	14.7	104.8	90.1
2010	0.0	14.7	104.8	90.1
2011	0.0	14.7	104.8	90.1
2012	210.0	14.7	104.8	-119.9
2013	0.0	14.7	104.8	90.1
2014	0.0	14.7	104.8	90.1
2015	0.0	14.7	104.8	90.1
2016	0.0	14.7	104.8	90.1
2017	0.0	14.7	104.8	90.1
2018	0.0	14.7	104.8	90.1
2019	0.0	14.7	104.8	90.1
2020	-433.3	14.7	104.8	523.4
NPV	668.6	185.0	1134.0	280.4
FIRR				7.0%

NPV = net present value, FIRR = financial internal rate of return, O&M = Operations and maintenance.

Source: staff estimates

PROJECT RATING

Table A11.1: Assessment of Project Performance at Completion

Criteria	Rating	Assessment
Relevance	Highly Relevant	The Project aligned well with the Government's policy and two-stage sector development plan and the Asian Development Bank's country operational strategy at appraisal.
Efficacy	Efficacious	The Project was constructed generally as appraised. Water production capacity was increased by 100,000 cubic meters per day, and unaccounted for water was reduced from 42% to around 35%, which is higher than the appraised target of 30%.
Efficiency	Efficient	Construction was delayed by 4 years. The financial internal rate of return of the Project is 7.6%, which is higher than WACC but lower than the appraisal estimates. The economic internal rate of return is 17.2%, which is higher than the EOCC
Sustainability	Likely	All project facilities were completed generally in accordance with the required specifications and are considered to be of quality. The Water Supply Company has shown the capacity to appropriately operate and maintain the project facilities.
Institutional Development and Other Impacts	Substantial	An interministerial circular on the setting of water tariffs was issued, and tariff adjustments for Ho Chi Minh City adhering to the new policy were put into effect in 1996. The water supply development plan to 2005 for Ho Chi Minh City was approved. Institutional capacity was strengthened. No significant negative social and environmental impacts were noted.

TABLE A11.2: PROJECT RATING

Criteria	Rating (A)	Weight (%) (B)	Score (A x B)	
A. Project Outcome				
1. Relevance	Highly Relevant	3	20	0.6
2. Efficacy	Efficacious	2	25	0.5
3. Efficiency	Efficient	2	20	0.4
B. Sustainability	Likely	2	20	0.4
C. Environmental, Social, and Institutional Development	Substantial	2	15	0.3
Overall Project Rating	Successful			2.2

The rating was made following the Asian Development Bank's *Guidelines for the Preparation of Project Performance Audit Reports*.