



# Completion Report

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Project Number: 27405  
Loan Number: 1514  
December 2006

## Socialist Republic of Viet Nam: Second Provincial Towns Water Supply and Sanitation Project

Asian Development Bank



## CURRENCY EQUIVALENTS

		Currency Unit	–	dong (D)
		<b>At Appraisal</b>		<b>At Project Completion</b>
		(31 October 1996)		(30 June 2005)
D1.00	=	\$0.0000909		\$0.000630358
\$1.00	=	D11,000		D15,864

## ABBREVIATIONS

ADB	–	Asian Development Bank
BME	–	benefit monitoring and evaluation
CPMU	–	central project management unit
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
ICB	–	international competitive bidding
LCB	–	local competitive bidding
lpcd	–	liters per capita per day
MOC	–	Ministry of Construction
NRW	–	nonrevenue water
O&M	–	operation and maintenance
PEEP	–	Public Environmental Education Program
PPC	–	provincial people's committee
PPIO	–	provincial project implementation office
PSC	–	project steering committee
SDR	–	special drawing rights
TA	–	technical assistance
UPWEC	–	urban public works and environment company
VWU	–	Vietnam Women's Union
WSC	–	water supply company
WTP	–	water treatment plant

## NOTE

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

<b>Vice President</b>	C. Lawrence Greenwood, Jr., Operations Group 2
<b>Director General</b>	A. Thapan, Southeast Asia Department (SERD)
<b>Country Director</b>	A. Konishi, Viet Nam Resident Mission, SERD
<b>Team leader</b>	Dinh Thang Le, Project Implementation/Program Officer, SERD
<b>Team member</b>	Phuong Hoa Thi Nguyen, Project Assistant, SERD

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## BASIC DATA

### A. Loan Identification

1.	Country	Socialist Republic of Viet Nam
2.	Loan Number	1514
3.	Project Title	Second Provincial Towns Water Supply and Sanitation Project
4.	Borrower	Socialist Republic of Viet Nam
5.	Executing Agency	Ministry of Construction
6.	Amount of Loan	\$69.0 million (SDR47.71 million)
7.	PCR Number	VIE 960

### B. Loan Data

1.	Appraisal	
	– Date Started	18 August 1996
	– Date Completed	31 August 1996
2.	Loan Negotiations	
	– Date Started	7 November 1996
	– Date Completed	8 November 1996
3.	Date of Board Approval	27 February 1997
4.	Date of Loan Agreement	11 June 1997
5.	Date of Loan Effectiveness	
	– In Loan Agreement	9 September 1997
	– Actual	17 November 1997
	– Number of Extensions	1
6.	Closing Date	
	– In Loan Agreement	30 June 2002
	– Actual	29 March 2006
	– Number of Extensions	2
7.	Terms of Loan	
	– Interest Rate	1% per annum
	– Maturity (number of years)	40 years
	– Grace Period (number of years)	10 years
8.	Terms of Relending	
	- Interest Rate	6.8% per annum
	– Maturity (number of years)	25
	– Grace Period (number of years)	5
	– Second-Step Borrower	Water supply companies:
		Tuyen Quang SDR2.704 million
		Ninh Binh SDR2.102 million
		Nghe An SRD7.627 million
		Quang Binh SRD4.218 million
		Quang Tri SRD4.301 million
		Binh Dinh SDR6.036 million
		Ben Tre SRD3.914 million

## 9. Disbursements

## a. Dates

**Initial Disbursement**  
22 December 1997

**Final Disbursement**  
29 March 2006

**Time Interval**  
99 months

**Effective Date**  
17 November 1997

**Original Closing Date**  
30 June 2002

**Time Interval**  
55 months

## b. Amount (\$)

Category <sup>a</sup>	Last		Net		Amount Disbursed	Undisbursed Balance
	Original Allocation	Revised Allocation	Amount Canceled	Amount Available		
01	37,740,000	16,268,693	0	16,268,693	16,268,693	0
02	11,398,000	30,359,307	0	30,359,307	30,359,307	0
03	1,073,000	1,106,556	0	1,106,556	1,106,556	0
04	1,302,000	2,230,975	0	2,230,975	2,230,975	0
05	4,802,000	7,655,789	0	7,655,789	7,655,789	0
06	1,779,000	1,645,894	0	1,645,894	1,645,894	0
07	10,907,000	6,483,124	6,483,124	0	0	0
<b>Total</b>	<b>69,000,000</b>	<b>65,750,338</b>	<b>6,483,124</b>	<b>59,267,214</b>	<b>59,267,214</b>	<b>0</b>

<sup>a</sup> 01 = civil works, 02 = equipment and material, 03 = incremental administration, 04 = institutional development and strengthening, 05 = consulting services, 06 = service charge, 07 = unallocated.

10.	Local Costs (Financed)	Appraisal	Actual
-	Amount (\$ million)	21.87	8.45
-	Percent of Local Costs	48.74	39.95
-	Percent of Total Cost	23.77	11.74

## C. Project Data

## 1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange	47.13	50.82
Local Cost	44.87	21.15
<b>Total</b>	<b>92.00</b>	<b>71.97</b>

## 2. Financing Plan (\$ million)

Cost	Appraisal Estimates			Actual		
	Foreign	Local	Total	Foreign	Local	Total
<b>A. Implementation Cost</b>						
Asian Development Bank Financed	45.35	21.87	67.22	49.17	8.45	57.62
Government Financed	0.00	19.68	19.68	0.00	12.70	12.70
Beneficiaries Financed	0.00	3.32	3.32	0.00	0.00	0.00
<b>Subtotal (A)</b>	<b>45.35</b>	<b>44.87</b>	<b>90.22</b>	<b>49.17</b>	<b>21.15</b>	<b>70.32</b>
<b>B. Interest During Construction Costs</b>						
Asian Development Bank Financed	1.78	0.00	1.78	1.65	0.00	1.65
Government Financed	0.00	0.00	0.00	0.00	0.00	0.00
Beneficiaries Financed	0.00	0.00	0.00	0.00	0.00	0.00
<b>Subtotal (B)</b>	<b>1.78</b>	<b>0.00</b>	<b>1.78</b>	<b>1.65</b>	<b>0.00</b>	<b>1.65</b>
<b>Total</b>	<b>47.13</b>	<b>44.87</b>	<b>92.00</b>	<b>50.82</b>	<b>21.15</b>	<b>71.97</b>



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

Item	Appraisal Estimates			Actual		
	Foreign	Local	Total	Foreign	Local	Total
<b>A. Base Cost</b>						
1. Land	0.00	0.24	0.24	0.00	0.95	0.95
2. Civil Works	25.84	22.78	48.63	11.21	10.64	21.85
3. Equipment and Materials	10.13	2.03	12.16	30.36	5.22	35.58
4. Consulting Services	2.86	2.16	5.03	6.69	0.97	7.66
5. Incremental Administration	0.33	2.40	2.72	0.00	1.94	1.94
6. Institutional Development and Strengthening	0.00	0.00	0.00	0.91	1.35	2.26
7. Other costs	0.00	0.00	0.00	0.00	0.08	0.08
<b>Subtotal (A)</b>	<b>39.16</b>	<b>29.60</b>	<b>68.76</b>	<b>49.17</b>	<b>21.15</b>	<b>70.32</b>
<b>B. Contingencies</b>						
1. Physical	2.71	2.05	4.75	0.00	0.00	0.00
2. Price	3.48	2.67	6.15	0.00	0.00	0.00
<b>Subtotal (B)</b>	<b>6.19</b>	<b>4.72</b>	<b>10.91</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total Base Cost</b>	<b>45.35</b>	<b>34.32</b>	<b>79.67</b>	<b>49.17</b>	<b>21.15</b>	<b>70.32</b>
<b>C. Interest/Service Charge</b>						
1. Interest During Construction	0.00	10.55	10.55	0.00	0.00	0.00
2. Service Charge on Bank Loan	1.78	0.00	1.78	1.65	0.00	1.65
<b>Total Project Cost</b>	<b>47.13</b>	<b>44.90</b>	<b>92.00</b>	<b>50.82</b>	<b>21.15</b>	<b>71.97</b>

## 4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants:		
Package A	Apr 1997	Dec 1997
Package B	Apr 1997	Dec 1997
Completion of Engineering Designs	Mar 1999	Dec 2001
Civil Works Contract		
Date of Award	Oct 1997	Dec 1998
Completion of Work	Dec 2001	Jun 2005
Equipments and Supplies		
Dates		
First Procurement	Oct 1997	Apr 1998
Last Procurement	Jun 1999	Sep 2004
Completion of Equipment Installation	Sep 2001	Jun 2005
Start of Operations		
Completion of Tests and Commissioning	Dec 2001	Oct 2005
Beginning of Start-Up	Jan 2002	Nov 2005
Other Milestones		
1. 30 June 2004	: First extension of loan closing date	
2. 07 January 2004	: Reallocation of loan categories	
3. 30 June 2005	: Second extension of loan closing date	
4. 29 March 2006	: Actual closing date of loan account	

## 5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 17 November 1997 to 31 December 1998	S	S
From 01 January 1999 to 31 December 1999	S	S
From 01 January 2000 to 31 December 2000	S	S
From 01 January 2001 to 30 June 2001	HS	S
From 01 July 2001 to 31 December 2001	HS	S
From 01 January 2002 to 31 March 2002	HS	S
From 01 April 2002 to 30 June 2002	HS	S
From 01 July 2002 to 30 September 2002	HS	PS
From 01 October 2002 to 31 December 2002	S	S
From 01 January 2003 to 31 December 2003	S	S
From 01 January 2004 to 31 December 2004	S	PS
From 01 January 2005 to 31 December 2005	S	PS
From 01 January 2006 to 31 July 2006	S	PS

HS = highly satisfactory, S = satisfactory, PS = partly satisfactory.

## D. Data on Asian Development Bank Missions

Name of Mission	Dates	No. of Persons	No. of Person-Days	Specialization of Members <sup>a</sup>
Fact-Finding	3–18 Apr 1996	3	48	d, e
Appraisal	18–31 Aug 1996	6	84	a, b, d, e, i
Mission 1	25–31 Jan 1997	2	14	a, e
Loan Inception Mission 2	2–14 Jun 1997	2	26	a, f
Special Loan Administration Mission 3	30 Mar–1 Apr 1998	1	2	a
Review Mission 4	22 Jun–3 Jul 1998	1	13	a
Review Mission 5	2–16 Dec 1998	1	15	a
Review Mission 6 <sup>b</sup>	21 Jun–8 Jul 1999	2	36	a, h
Review Mission 7 <sup>b</sup>	22 Nov–9 Dec 1999	1	18	a
Review Mission 8	3–6 Mar 2000	1	4	a
Midterm Review Mission 9 <sup>b</sup>	27 Jun–13 Jul 2000	3	51	a, b, h
Special Loan Administration Mission 10	19–21 Sep. 2000	1	3	a
Review Mission 11 <sup>b</sup>	28 Nov–14 Dec 2000	1	16	a
Review Mission 12	21–22 Feb 2001	2	4	a, c
Review Mission 13 <sup>b</sup>	20 Jun–3 Jul 2001	2	26	c, h
Review Mission 14 <sup>b</sup>	22 Oct–2 Nov 2001	1	12	c
Review Mission 15 <sup>b</sup>	24 Jun–5 Jul 2002	1	12	c
Review Mission 16 <sup>b</sup>	28 Nov–4 Dec 2002	2	14	c, h
Review Mission 17	2–13 Jun 2003	1	11	c
Review Mission 18	24 Nov–5 Dec 2003	1	12	c
Review Mission 19	12–16 and 22 Apr 2004	2	6	b, g
Review Mission 20	12–16 Jul 2004	2	10	b, g
Review Mission 21	8–12 Nov 2004	2	10	b, g
Review Mission 22	15–18 Dec 2004	1	4	b
Review Mission 23	1–10 Mar 2005	3	30	b, g
Special Loan Review Mission 24	14–15 Jul 2005	2	4	b, g
Special Loan Review Mission 25	10 Aug. 2005	2	2	b, g
PCR Mission <sup>c</sup>	30 Jul–9 Aug 2006	3	30	b, 2e

<sup>a</sup> Senior project specialist, b – programs and project implementation officer, c - senior project engineer, d - project engineer, e - staff consultant, f - assistant (administration), g - principal project implementation specialist, h - project analyst, I - counsel.

<sup>b</sup> Missions were fielded to concurrently review the progress of projects under loans 1361-VIE and 1514-VIE.

<sup>c</sup> The project completion report was prepared by Le Dinh Thang, project implementation and programs officer.





## I. PROJECT DESCRIPTION

1. In 1994, the Government of Viet Nam requested the Asian Development Bank's (ADB's) assistance in rehabilitating and expanding the water supply and sanitation systems in the seven provincial capital towns of Ben Tre, Dong Ha, Dong Hoi, Ninh Binh, Qui Nhon, Tuyen Quang, and Vinh. Subsequently, a feasibility study was carried out in 1995. An ADB fact-finding mission was fielded in April 1996, followed by an appraisal mission in August 1996, which firmed up the scope of the Project and its implementation arrangements. The loan, in the amount of SDR47.71 million (\$69.0 million during appraisal), was approved in 27 February 1997.<sup>1</sup>

2. The urban water supply and sanitation facilities in all of Viet Nam's urban centers were generally in poor condition. The Government's priority for investing into the sector was based on the relative potential for economic growth and the contribution that improvements in water supply and sanitation could make towards accelerating economic growth. The seven project towns were selected from 27 provincial towns identified by the Government in consultation with the World Bank in 1991. The Project was part of the Government's continued efforts, following on from the Provincial Towns Water Supply and Sanitation Project<sup>2</sup> (the first-phase project).

3. The Project aimed to benefit populations in the seven provincial towns by enhancing quality of life and health through improved water supply and sanitation facilities while creating conditions conducive to sustained social development and economic growth. The Project's objectives were to provide communities in the provincial towns with improved access to safe water, improve the urban environment, enhance public awareness of hygiene and sanitation, and strengthen existing sector institutions through a blend of capacity building and policy reform. Appendix 1 shows a design and monitoring framework prepared by the Project Completion Review Mission.<sup>3</sup>

4. The project scope proposed at appraisal comprised the following four parts:

- (i) part A: public environmental education program,
- (ii) part B: water supply systems development,
- (iii) part C: environmental sanitation improvements, and
- (iv) part D: implementation assistance and institutional strengthening.

## II. EVALUATION OF DESIGN AND IMPLEMENTATION

### A. Relevance of Design and Formulation

5. At the time of appraisal, the Government's sector development plan gave priority to providing safe drinking water and proper sanitation to the majority of people in a cost-effective manner. The Government formulated preliminary plans to develop the water supply and sanitation sector with the goal of achieving water supply coverage of 85% of the urban and suburban population by 2000, and 100% by 2011. The criteria applied for selecting which centers should be provided with piped water included that they should have (i) populations of more than 15,000; (ii) fewer than 25% of households involved in agriculture; and (iii) population density higher than 100 persons per hectare. Based on these criteria, 13 provincial towns were selected, of which six were covered by the first-phase project, and the remaining seven by this Project.

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<sup>1</sup> ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Socialist Republic of Viet Nam for the Second Provincial Towns Water Supply and Sanitation Project*. Manila.

<sup>2</sup> ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to the Socialist Republic of Viet Nam for the Provincial Towns Water Supply and Sanitation Project*. Manila (approved on 17 August 1995 and completed in December 2004). The Project covered the six provincial towns of Long Xuyen, Nha Trang, Phan Thiet, Pleiku, Thai Nguyen, and Thanh Hoa.

<sup>3</sup> No design and monitoring framework was prepared for the Project during project preparation.

6. ADB's sector strategy at the time of appraisal was to (i) selectively finance the rehabilitation and upgrading of water supply and sanitation systems in urban centers to improve the quality and extent of access to safe water and sanitation, (ii) induce policy change to enable sustainable investments at both the central and provincial levels, and (iii) encourage institutional reform and development to complement policy change. More specifically, it focused on rehabilitating water treatment, transmission, and distribution facilities while reducing nonrevenue water (NRW) in priority urban areas. ADB supported the Government's effort to provide the water supply companies (WSCs) with a greater level of operational and financial autonomy in order to be able to sustain large investments. *ADB's Country Strategy and Program (CSP) for Viet Nam (2007–2010)*<sup>4</sup>, which is based on ADB's Medium-Term Strategy II 2006–2008, is in process of finalization. The country strategy and program supports the Government's 2006–2010 Socio-Economic Development Plan, which aims to achieve sustainable development across three axes: economy, society, and environment. Providing access to safe water for 95% of the urban population and 75% of the rural population by 2010 is one of the targeted outcomes under the environmental axis. Thus, at both appraisal and completion, the Project was extremely well aligned with both the Government's development objectives and ADB's sector and county strategy.

7. The project design was sound and relevant at appraisal and completion, and it adequately incorporated the Project's objectives. The quality of project preparatory technical assistance (TA) was satisfactory, aiming to involve a high level of stakeholder participation and ownership by Ministry of Construction (MOC) and provincial people's committees (PPCs). No major changes in project scope were made and only minor changes in project design were observed, including (i) changes in the quantity or capacity of water intake and production facilities,<sup>5</sup> and (ii) increases or decreases in the length of water mains, as well as of sewer and drainpipes. These changes helped maximize the Project's benefits by covering wider areas of the project towns with improved access to safe water and environmental sanitation.

## **B. Project Outputs**

8. Project outputs at completion were essentially the same as envisaged. Minor changes that were made did not significantly affect project costs, implementation schedules, expected benefits, or other measures of efficiency. Software for benefit monitoring and evaluation (BME) reporting was developed and provided to all the provincial project implementation offices (PPIOs). BME reports were prepared annually and provided updated information about the performance of WSCs' utilities and relevant socioeconomic data during project implementation. As designed, the reports did not include survey data regarding project impacts felt by beneficiaries. The quality of works completed was generally satisfactory. Delays in project implementation were basically attributed to delays in procurement. Project outputs by component are discussed in the following paragraphs, both as anticipated during appraisal and with regard to deviations from the original design.

### **1. Part A: Public Environmental Education Program**

9. Part A consisted of design and implementation of townwide community health and hygiene education programs to educate the community on clean water and sanitation. The implementation of the public environmental education program (PEEP) involved wide-ranging participation, including communities, PPCs, Vietnam Women's Union (VWU), local preventive medicine units, and United Nations volunteers. The PEEP activities began with selection of motivators from wards

<sup>4</sup> Author: O. Shrestha, SERD. October 2006.

<sup>5</sup> These included, among others, (i) increases in the number of deep wells from eight to 10 in Ben Tre, of clarifiers from one unit to two in Ninh Binh, and of water reservoirs from two units to three in Dong Ha; and (ii) decrease in the number of transformers from 11 units to three units in Tuyen Quang and deep wells from 12 to nine in Qui Nhon.

and communes who were to assist the PEEP team at the provincial level. More than 150 motivators were selected in each town. The PPIOs coordinated with provincial government offices, provincial women's unions, and various communities. More than 2,000 people, including schoolchildren, participated in various activities in each town. These activities included group meetings to learn about clean water and environmental sanitation, mass media campaigns, painting and writing contests for school children, and the development of films on safe water and sanitation. The PEEP enabled communities to become sensitized to the benefits of improved water and sanitation facilities, and they were actively engaged in project design and implementation. One result was that the number of households applying for house connections and septic tank installation increased.

## **2. Part B: Water Supply Systems Development**

10. Due to polluted water sources and deteriorated water production and distribution facilities, the water supply systems in all project towns were constrained from meeting the increasing demands from their communities. Part B included rehabilitating and expanding water supply systems, reducing NRW, and improving service levels. It aimed to achieve provision of improved access to safe water around-the-clock to communities in the seven project towns by 2011. By improving existing intake structures and developing water sources, all the project towns except Tuyen Quang<sup>6</sup> have secured reliable sources of water that will meet the water demands targeted for 2011. Of the seven towns, four (Ben Tre, Dong Ha, Qui Nhon, and Tuyen Quang<sup>7</sup>) developed groundwater by constructing a total of 43 boreholes. The remaining three towns (Dong Hoi, Ninh Binh, and Vinh) developed surface water, either from a river or a lake, by constructing new raw water intake structures or refurbishing existing ones with new intake pumps.

11. All the project towns had existing water treatment plants rehabilitated or upgraded so that they can be operated at their originally designed capacities. In addition, new water treatment plants were constructed for all the towns except Tuyen Quang<sup>8</sup> to meet the forecast demand through 2011. The Project created an additional 135,000 cubic meters (m<sup>3</sup>) per day of treated water, which compares to total daily production capacity before the Project of around 70,000 m<sup>3</sup>. The treated water meets national quality standards and is drinkable without boiling. Pumping stations were rehabilitated and reconstructed to replace aged electrical and mechanical equipment. Water storage reservoirs with total capacity of 20,000 m<sup>3</sup> were constructed for each of the project towns to ensure around-the-clock water supply in the most efficient manner.

12. Improving and expanding distribution systems, along with installing house connections, were essential to reduce NRW. That helped improve WSCs' financial positions and to deliver more water to new consumers. Distribution systems in all project towns were improved and strengthened to serve the targeted population until 2011 and reduce the level of NRW from 33–57% to 25% by 2011. A total of 62,000 house connections with meters were newly installed under the Project, compared with about 81,000 house connections before the Project. As of June 2006, the rate of NRW in the seven project towns ranged between 21% and 30%. House connections totaled some 150,000. As a result, the population served ratio increased from 30%–50% in 1997 to 63%–87% upon project completion. No standpipes were installed, as all the WSCs decided to terminate standpipe services. All the WSCs reported that people were happy with direct access to the systems through house connections and were able to pay the water tariffs.

<sup>6</sup> Well water contains an excessive level of iron and manganese. Water will be corrosive with a high level of activated carbon dioxide, which poses a risk to proper operation of the entire water supply system in Tuyen Quang. Water treatment facilities to remove iron and manganese will be essential to ensure sustainable operation of the water supply system and deliver safe water to the population

<sup>7</sup> The existing water treatment plant in Dong Ha uses surface water from the Vinh Phuoc River.

<sup>8</sup> Tuyen Quang had its existing water treatment plant upgraded from 5,000 m<sup>3</sup>/day to 12,500 m<sup>3</sup>/day.

### 3. Part C: Environmental Sanitation Improvements

13. Part C included constructing 65.2 km and rehabilitating 65.1 km of primary, secondary, and tertiary drainage systems, improving sanitation systems, and introducing septage management systems. At project completion, 44.9 km of drainpipes and culverts were newly installed and 47.1 km of existing drainage facilities were cleaned and rehabilitated. Some sections of the drainage pipes originally envisaged were cancelled as they had been constructed under separate projects or excluded from the revised city plan. New drainage systems were installed primarily in shopping and densely populated residential areas where the environmental degradation was significant. The extended combined drainage systems greatly benefited the urban environment, contributing to the reduced incidence of flooding in the city center and enabling a number of households to discharge septic supernatant and sullage waste into the drainage systems.

14. A total of 14,170 toilets with septic tanks were installed, compared with 11,540 units revised at the project inception. Among the seven towns, Vinh made the greatest achievement, as it installed 7,942 septic tanks, compared with 6,500 units originally envisaged. All these septic tanks installed were connected to the combined drainage systems where available. Some households having existing septic tanks also connected their sullage and septic tanks to the drainage systems constructed under the Project. Newly introduced MOC and provincial regulations setting forth sanitation standards were effective in encouraging people to install and connect septic tanks to the drainage systems. The repayment of loans provided to low-income households was continuously used as revolving funds for new subscribers to install their own toilets.

### 4. Part D: Implementation Assistance and Institutional Strengthening

15. Part D included consulting services for Project implementation management, training to WSC and PPIO staffs, and other implementation supports. For project implementation management, two packages of consultants were engaged, one for the three northern towns of Ninh Binh, Tuyen Quang, and Vinh, and the other for the four central and southern towns of Ben Tre Dong Ha, Dong Hoi, and Qui Nhon. The inputs of personnel estimated at appraisal were 1,395 person-months in total over a service period of 57 months, consisting of 180 international and 1,215 national. However, the services were provided over a period of 84 months, from April 1998 to June 2005, with substantial increases in the inputs of person-months to 1,887 person-months in total, consisting of 238 international and 1,649 national. This was due to the prolonged project implementation. It resulted in a substantial 26.6% increase in the cost of consulting services from \$5.45 million estimated at appraisal to \$6.91 million. Both the international consultants were released when the Project was substantially completed and all facilities including equipment were found functional. Commissioning tests for the system operation were supervised by the local consultants engaged under a separate contract financed by the Government.

16. WSCs' capacities in the areas of operation and maintenance (O&M), pipelaying, financial management, and sanitation works were strengthened with provision of training, construction equipment, and vehicles. The central project management unit (CPMU) organized training courses on procurement, disbursement, and project accounting for PPIO staff of the 13 WSCs under the two ADB-funded projects. Training had been also conducted on water loss reduction under TA<sup>9</sup> piggybacked to the first-phase project. Adequate computerized billing and management information systems were installed in all WSCs and are fully operational except at Tuyen Quang.

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<sup>9</sup> ADB. 1995. *Technical Assistance to the Socialist Republic of Viet Nam for Capacity Building for Provincial Water Supply and Sanitation Planning and Management*. Manila (TA 2375-VIE approved on 17 August, for \$500,000).



## C. Project Costs

17. At project appraisal, the total project cost including service charges and physical and price contingencies was estimated at \$92.0 million, comprising \$47.1 million in foreign currency cost and \$44.9 million in local currency cost. The loan was envisaged to finance \$69 million (75%) of the total project cost, that is, the entire foreign exchange cost of \$47.13 million (including \$1.78 million for the service charges on the ADB loan) and \$21.87 million of the local currency cost. The Government and project beneficiaries were to cover the balance of the local currency costs, namely \$23 million equivalent, or 25% of the total.

18. At project completion in June 2005, the actual cost of the Project was \$71.97 million, with a foreign exchange cost of \$50.82 million and a local currency cost of \$21.15 million equivalent. ADB financed \$59.27 million (82% of the total cost), of which \$50.82 million (including \$1.65 million for service charges on the ADB loan) was for foreign exchange costs and \$8.45 million for local currency costs. The Government's counterpart contributions totaled \$12.70 million, or 18%. Beneficiaries<sup>10</sup> partly contributed to the improvement of their sanitation facilities. With depreciation of the SDR, the net value of the ADB loan declined to \$65.75 million at project completion. The unused loan amount of SDR4,519,053.34 (about \$6.48 million) was cancelled on 29 March 2006.

19. That the Project actually cost less than appraised was especially due to the facts that (i) bid prices for the major civil works were much lower than estimated at appraisal, (ii) depreciation of the local currency against the dollar reduced the local currency expenditures in dollar terms, and (iii) the unit cost of constructing a septic tank was lower than estimated.<sup>11</sup> As a result of major civil works being split into several contract packages, bidding became more competitive with the participation of local contractors and resulted in lower bid prices. Moreover, as local contractors associated with foreign contractors were awarded major civil work contracts, a substantial portion of contract prices was paid in local currency. That resulted in lower contract prices in dollar terms.<sup>12</sup> Some increase in foreign exchange costs was mainly due to higher-than-estimated contract prices for procuring pipe materials and equipment. A substantial increase in the cost of equipment and materials and decrease in the cost of civil works at project completion were basically related to the cost of pipe materials. At appraisal, those costs had been estimated under the category of civil works, but these were allocated to the category of equipment and materials at project completion.<sup>13</sup> Reductions in the length of drainage systems also attributed to the lower cost of civil works. The Project's costs estimated at appraisal and actual project costs are shown in Appendix 2.

## D. Disbursements

20. Total disbursements of the ADB loan were \$59.27 million, compared with \$69 million envisaged at appraisal. Initial disbursement took place in December 1997 to provide imprest funds for the CPMU to procure computers and office equipment. Disbursements were slow, however, and especially for the first 3 years. These spread over an 8 year period from 1998 to 2006, compared with the 5 years from 1996 to 2001 originally scheduled. Disbursements picked up late in 2000

<sup>10</sup> Approximately two thirds of septic tank construction costs were paid by beneficiaries, but these were not quantifiable.

<sup>11</sup> The unit cost for constructing a septic tank was estimated at \$323 at appraisal, whereas the actual cost was \$120. This reduced the total costs by \$3.5 million.

<sup>12</sup> For example, three contract packages were originally scheduled for the construction of water treatment plants and drainage improvement works for the seven towns. However, these were split into seven packages under international competitive bidding (ICB) procedures plus a number of packages under local competitive bidding (LCB) procedures. As a result, the actual contract amounts for these packages was around \$30 million, compared with an estimated \$45.8 million at appraisal.

<sup>13</sup> The costs of equipment and materials and of civil works were \$35.6 million and \$21.9 million at project completion, respectively, whereas their estimates at appraisal were \$12.1 million and \$48.6 million, respectively. Pipe materials costs some \$20 million.

when detailed design and bidding documents for supply of pipe materials and equipment were completed and contracts awarded. Despite completion of the Project in June 2005, the last disbursement was made and the loan account was closed only on 29 March 2006, as the CPMU needed to fully liquidate expenditures incurred before the loan closing date, including those incurred from the imprest accounts, with all the PPIOs. It also had to refund the outstanding balance to ADB with information satisfactory to ADB showing that all expenditures had been incurred prior to the loan closing date. The provisions for counterpart funds were sufficient and generally made in a timely manner.

21. An imprest fund was established for the CPMU in December 1997 to facilitate timely disbursements of eligible local currency payments, small foreign currency payments, and letter of credit transactions not exceeding \$50,000 per payment. The imprest fund was distributed to each PPIO to pay local contractors and its incremental administration expenditures. With the turnover ratio exceeding 2.0, ADB accepted an increase of imprest fund from \$0.5 million to \$1 million in 2000 to facilitate payment progress for local competitive bidding (LCB) contracts. A breakdown of yearly disbursements is in Appendix 3.

## **E. Project Schedule**

22. The loan was approved on 27 February 1997 but was declared effective on 17 November 1997 after the sixth replenishment of the Asian Development Fund became available. At appraisal, it was envisaged that the Project would be implemented over 5 years from January 1997 to December 2001. Project implementation actually commenced, however, with consultants' services in February 1998 and was physically completed on 31 June 2005, which was 3.5 years behind the schedule envisaged at appraisal. The loan account was closed on 29 March 2006. Delays occurred at all the stages of project implementation, including the pre-detailed design, bidding and bid evaluation, and construction stages. The actual project implementation schedule compared with that appraised is in Appendix 4.

23. Given significant delays in recruiting international consultants experienced in the first-phase project, an advance action was taken. Nevertheless, the consultants were engaged only in December 1997, 10 months after ADB's loan approval, pending the sixth replenishment of the Asian Development Fund until November 1997. During the pre-detailed design stage, the consultants were required to update existing feasibility study reports and prepare a basic design report with field data before proceeding to detailed design and preparing bidding documents. The consultants completed these reports late in 1998 and they were approved by the Government in March 1999, more than 1 year after signing of their contracts. Preparation of detailed design and bidding documents for major civil works and supply contracts started only in September 1998 and was basically completed in December 1999. However, the last batch of bidding documents was finalized only in late 2000, as the review and comments by the PPIOs and revision of detailed designs and bidding documents by the consultants were extremely slow and time-consuming.<sup>14</sup>

24. During the bidding and bid evaluation stage, significant delays were experienced, in particular, for major international competitive bidding (ICB) turnkey contracts for civil works, where a two-stage and two-envelope method was used. Bid evaluation usually took more than 1 year<sup>15</sup> in

<sup>14</sup> In the case of the ICB contract (CW1A) for principal water and sanitation works, almost 2 years were spent in reviewing and revising detailed design and bidding documents. Namely, the detailed design and bidding documents were prepared in June 1999, but bid were called for only in August 2001 after several revisions of the documents.

<sup>15</sup> In the case of the ICB contracts (CW1A&B) for principal water and sanitation works, 1 year was spent from the date of bid invitation (6 August 2001) to the signing of the contract (31 July 2002), whereas for the ICB contract (CW2A) for design and construction of water treatment facilities, 1-1/2 years was spent from the date of bid invitation (8 June 1999) to the signing of the contract (6 December 2001).

case of procuring large ICB contracts for civil works and supply of pipe materials and equipment. The worst of all was the contract for design and construction of water treatment facilities, which took more than 3 years from the date of first bid invitation until the contract was awarded. A main reason for this was rebidding.<sup>16</sup> The two-stage and two-envelope method involved time-consuming procedures. Lengthy review and concurrence by the PPIOs and government approvals, including from the Prime Minister's office in some instances, exacerbated the case.

25. During the construction stage, significant delays were experienced in implementing major civil works, particularly in constructing water treatment plants. Almost all ICB contracts for civil works failed to complete the works within the original contract period. Most construction works were completed 6 to 12 months behind the contractually agreed dates.<sup>17</sup> The last ICB contract (CW2B) for constructing new water treatment facilities for four towns was completed in June 2005, although most of the other works had been completed by 30 June 2004. Given that completion of the last ICB contract was essential to achieving the main project objective, ADB initially granted a 2 year extension until 30 June 2004 with the condition that a second extension would be granted only if the last ICB contract was awarded before November 2003. ADB approved extending the loan closing date until 30 June 2005 on 27 November 2003, as the CPMU met that condition.

## **F. Implementation Arrangements**

26. MOC, through the Management Board for Water Supply and Sanitation Development Project,<sup>18</sup> was the Executing Agency for the Project. The Management Board expanded its CPMU established under the first-phase project to handle the overall implementation of the Project. The CPMU was headed by a full-time project director and assisted by a deputy project director and staff, including an accountant. All the staff were reasonably qualified for project implementation management as they were experienced and had gained knowledge from the first-phase project.

27. The implementing agency for each project town was the WSC. A PPIO was established to assist the WSC in implementing the Project at the provincial level and to coordinate with the CPMU. PPIOs were headed by WSC directors or deputy directors. PPIO staff were inexperienced and had limited understanding about ADB's regulations and guidelines in procurement and bid evaluation, as only limited training under TA had been piggybacked to the first-phase project. Given the PPIOs' lack of experience in implementing externally financed projects, the CPMU was mandated responsibility for procuring all civil works and supplying materials and equipment under ICB and international shopping procedures. Procurement of such minor civil works as site surveys and investigations, rehabilitation of water supply facilities, installation of water distribution pipes, and installation of septic tanks were undertaken by the PPIOs through LCB and direct appointment procedures. No changes in implementation arrangements occurred during the project implementation period. These arrangements appeared appropriate to deliver the Project's outputs and achieve its purpose in an efficient manner.

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<sup>16</sup> In the case of the ICB contract (CW2B) for design and construction of water treatment facilities, bids were invited three times, as no responsive bid was received in the first instance and negotiations with the sole responsive bidder failed in the second. Accordingly, procurement was split into four packages to attract local contractors and bids were invited a third time. Contracts were awarded only in September 2003, almost 3 years after the first bidding was invited in November 2000.

<sup>17</sup> In the case of ICB contract CW1B, the work was completed 35 months after signing of the contract although the contract period was 17 months.

<sup>18</sup> In August 2003, the project's name was changed to the Management Board for Urban Technical Infrastructure Project.

## **G. Conditions and Covenants**

28. In general, compliance with all covenants was achieved, although some were held up by delays in project implementation. The status of compliance with loan covenants is in Appendix 5. Covenants that could not be fully achieved were related to financial matters, as follows:

- (i) Operational integration by 31 December 1997 of WSCs and urban public works and environmental companies (UPWECs) for the integrated delivery of water and sanitation services (covenant 7)—Of seven towns, only Qui Nhon set up operational integration of water and sanitation services. The other WSCs remained the same but transferred 10% of collected water tariffs to the municipal governments for O&M of drainage systems. MOC clarified to ADB in a letter dated 22 December 2003 that this covenant could not be complied with due to organizational structure, as the WSCs were business-oriented entities operating under the provincial governments while the UPWECs are under the municipal governments.
- (ii) Adjustment of water tariffs on an annual basis to meet financial targets (covenant 9)—Water tariffs generally had been adjusted at a 2 year interval. As of June 2006, tariff rates in the WSCs were between D2,500 and D4,000 for domestic and D2,000 and D5,600 for commercial and other users. These rates were still insufficient to meet the financial targets.
- (iii) Ensuring that the debt-service ratio be at least 1.2:1 by 31 December 2003 for Qui Nhon and Tuyen Quang, by 31 December 2004 for Dong Ha, by 31 December 2005 for Ben Tre, Dong Hoi and Ninh Binh, and by 31 December 2006 for Vinh (covenant 11)—The debt-service ratio was less than 0.5 for every WSC. With the introduction of the proposed tariff increases, the debt-service ratio will be improved as follows: 1.38 for Ben Tre, 0.86 for Dong Ha, 1.03 for Dong Hoi, 3.46 for Ninh Binh, 1.5 for Qui Nhon, 0.82 for Tuyen Quant, and 1.15 for Vinh.

## **H. Related Technical Assistance**

29. Project preparatory TA was provided to conduct a feasibility study in 1995–1996. The TA was in general satisfactory, clearly providing project scope, cost estimates, and implementation arrangements to achieve its objectives. The Project was designed to blend critically needed infrastructure developments with community awareness and education. The feasibility study was, however, reviewed and updated at the beginning of project implementation to consider needs for minor adjustments in scope of works and to update cost estimates. The Project was implemented basically according to the scope of works and implementation arrangements proposed in the feasibility study report, while changes in procurement packaging, and particularly for major civil works, were made to attract more qualified contractors—including local contractors—in consideration that only very few foreign contractors participated in bidding in several instances.

## **I. Consultant Recruitment and Procurement**

30. A total of 10 packages were envisaged at appraisal for procuring civil works, as well as to supply equipment, materials, and services. ICB, international shopping, and LCB procedures were to be used. This included two multiple-contract packages for minor construction works and procuring institutional support equipment and vehicles through direct appointment or force account. With the seven towns divided geographically in the north and south of Viet Nam, consulting services were split into two packages, one covering three towns in the north and the other covering four towns in the center and south. This arrangement was rather costly and ineffective, as consultant personnel were thinly spread over the two consultant teams, each with assignment of a team leader and key personnel which was duplicate and unnecessary if only a single firm was

engaged. Also, the CPMU had to exert extra efforts to ensure that two consultants had a uniform approach and methodology in project implementation.

31. Procurement of pipe materials, valves, water meters, mechanical and electrical equipment, and vehicles was originally envisaged through four packages—one for transmission mains and primary and secondary distribution pipes, and the other three for tertiary distribution and service pipes, water meters, equipment, and vehicles. However, these were split into 20 packages by kind and time of delivery. Procurement of major civil works for rehabilitation and construction of water supply and drainage systems was divided into six packages, while three packages had been envisaged originally. Repackaging was basically done to advance implementation of rehabilitation works prioritized by the PPIOs. The repackaging caused excessive administrative burdens for the CPMU, however, as it needed to seek review and approval by the PPIOs, MOC, and in some instances the Prime Minister's office, for a large number of documents that included bidding documents, bid evaluation, and contract awards. This was a major factor causing delays in project implementation. The use of a two-stage and two-envelope turnkey contract for civil works was another factor delaying project implementation, as it involved a time-consuming process.

#### **J. Performance of Consultants, Contractors, and Suppliers**

32. Overall, performance of both the consultants for parts A and B was marginally satisfactory. Staffing arrangements between the foreign and local consultants were inappropriate, as a substantial portion of tasks were assigned to the less qualified local consultants. The working relationship with the CPMU was not smooth, due mainly to the consultants' inability to respond to project needs in a timely manner over the entire period of project implementation. During the design and preconstruction stage, the consultants failed to prepare feasibility study review reports as well as detailed design and bidding documents in a timely manner. The designs prepared by the consultants did not conform to field conditions in several instances. The consultants, however, did not respond favorably to requests from the CPMU and the PPIOs to revise or modify detailed design and bidding documents.<sup>19</sup> During the construction stage, the consultant team leaders were replaced two to three times, which undermined the continuity and accountability of the consultants in fulfilling their responsibilities under the contracts.

33. Performance of the contractors for major civil works was also not satisfactory. None of them completed the works within the original contract periods.<sup>20</sup> There were completion delays of 50% to 100% for the civil works contracts for principal water and sanitation works and for the design and construction of water treatment plants. It is true that delays in land acquisition in some instances hindered the contractors from carrying out their work according to schedule. Intending to minimize their costs and expenditures, however, the contractors basically failed to mobilize sufficient resources to complete all the works within the contractual period. Some main contractors failed to provide adequate assistance to joint-venture partners or sublet the work, which caused implementation delays and poor control over the quality of works. Performance of suppliers was in general satisfactory. There were no significant delays in delivering materials and equipment.

#### **K. Performance of the Borrower and the Executing Agency**

34. In general, the performance of the Borrower and Executing Agency was satisfactory. CPMU staff had gained practical knowledge through implementing the first-phase project. A government

<sup>19</sup> For example, delays in revising and finalizing bidding documents for a civil works contract (CW1A) that took almost 1-1/2 years were mainly due to the consultant's inability to fulfill the assigned works in a timely manner, even though the PPIOs spent significant time in providing their comments to the consultant.

<sup>20</sup> In the case of the ICB contract (CW1B) for principal water and sanitation works, 35 months was spent for completion while 17 months had been provided under the contract.

decree, no. 88/1999/CP, was issued in September 1999 to decentralize and delegate approval authority for procurement activities to the lower level. Approval from the Prime Minister's office and line ministry was nevertheless still required for updated feasibility studies, bid plans, technical design, bidding documents, bid evaluation, and awards for ICB contract packages. Approval of higher authorities was also required for any changes in scopes of work, costs, and implementation methods. The complicated bid evaluation mechanism caused that process to be particularly lengthy. Unanimous decision was required for the results of bid evaluation undertaken by the bid evaluation team of more than 10 members and by the bid evaluation committee of eight members. These requirements substantially affected project implementation relative to schedule. Government rules and regulations could not be changed without concurrence of higher government authorities, even as the ADB review missions reiterated the need for improvement.

35. The WSCs and PPIOs repeatedly requested changes in design and quantities of materials and work. This substantially delayed preparations of detailed design and bidding documents. Delays in reviewing bidding documents and bid evaluation by the PPIOs were basically due to limited capacity of staff at the WSCs and PPIOs, as well as a lack of understanding of ADB procurement procedures. The PPIOs sometimes failed to respond to the CPMU's requests to submit progress and BME reports, as well as to prepare the likes of resettlement plans and NRW reduction programs. That led to delays in complying with relevant loan covenants and action plans. Changes in management at the PPCs and WSCs that occurred during project implementation caused difficulty for the CPMU in coordinating. The new managers would not fully understand the project background, commitments made by their predecessors, and various procedures to be followed. During project preparation and implementation, ADB provided CPMU and PPIOs staff with three training courses—one for procurement and two for disbursement. The PPIOs, however, could not fully benefit from these training courses, as only a limited number of staff were trained. Performance of the PPIOs is therefore assessed in general as partly satisfactory, although their contributions were important and essential. The assessment of the Executing Agency's capability at appraisal was reasonably accurate, but various procedures required with respect to procurement were not fully taken into account in the project implementation schedule.

#### **L. Performance of the Asian Development Bank**

36. During implementation of the Project from November 1997 to June 2005, ADB dispatched a total of 25 review missions, including inception, midterm review, and two special loan administration missions, to resolve procurement issues. The review missions were effective and instrumental in resolving various implementation issues. The missions had open discussions with the staffs of the CPMU, PPIOs, WSCs, government agencies, consultants, and contractors to speed up project implementation. The missions always prepared *aide memoire*, which provided, among others, recommendations for necessary actions to be taken by responsible parties. The time-bound action plans were particularly effective to press the CPMU and other agencies concerned to resolve critical issues in a timely manner. The missions made every effort to have the Project completed within a minimal time after extension of the loan closing. Given, however, the substantial delays experienced in procurement, training of PPIOs staff on procurement should have been both more intensive and extensive to ensure that all PPIO staff, including management staff, were fully familiarized with international bidding procedures. ADB staff (i) provided valuable advice and responded in a timely manner to queries received; (ii) assisted the CPMU to complete payment to the contractors and consultants within the extended loan period; and (iii) reviewed and processed documents, including withdrawal applications and inquiries from the CPMU and other entities, without undue delays. Overall, ADB's performance was satisfactory.

### III. EVALUATION OF PERFORMANCE

#### A. Relevance

37. The Project was assessed as highly relevant. It was consistent with the Government's priorities at the time of appraisal and remains consistent with the Government's current priorities as given in the approved socioeconomic development plan (SEDP) for 2006-2010. The water decree, which is now being prepared by the Government, will set forth long-term sector development targets and standards. The principle objective of that decree will be to provide access to safe water for 100% of the population by 2020 using a community-centered and demand-responsive approach. The Government encourages that water supply services be developed taking a commercially oriented approach. ADB's medium-term strategy II sets environmental management, including improved urban water supply, sanitation, and waste management, as one of its five strategic priority areas. The Project was developed following a demand-responsive approach to improving the water supply and sanitation in all the project towns. The Project also provided the needed support for institutional strengthening of the WSCs in operating, maintaining, and managing water supply and sanitation services on a sustainable basis. Project design, therefore, was well aligned with both the Government's policy and ADB's strategy. No major changes that would have impacted on project relevance were made at the midterm review and other points of implementation.

#### B. Effectiveness in Achieving Outcome

38. The Project is assessed as effective in achieving its outcome envisaged at appraisal. The level and extent of public awareness of improved water supply and sanitation were greatly enhanced through the PEEP, as it appears that people's willingness to pay higher water tariffs and construct septic tanks is becoming greater than before. All the PPCs support the WSCs' proposals to raise water tariffs. As of June 2006, the population served in the seven project towns is estimated at about 711,000, and the population served ratio ranged between 63% and 87%. The water production capacity now exceeds 200,000 m<sup>3</sup>/day. With WSCs' continued efforts to install distribution pipes and house connections, about 1.12 million people (i.e., 100% of the urban and suburban population) in the project towns will have access to safe water by 2011. As of July 2006, average domestic water consumption in these towns was estimated to range between 82 liters per capita per day (lpcd) and 135 lpcd, compared with 100 lpcd envisaged at appraisal. This rate will gradually increase due to pressurized, 24-hour water supply services. NRW estimated at appraisal ranged between 33% and 57%. As of June 2006, all the WSCs achieved their targets, with rates between 21% and 30%. Installation of computerized billing and operation monitoring systems, plus training of WSC staff, contributed to the WSCs' improved financial and maintenance management.

39. Inadequate drainage systems were cleaned and rehabilitated, and additional drainpipes and box culverts were installed to improve the urban environment where floods occurred frequently. As more households have septic tanks and sullage connected to the drainage systems, the urban environment will improve. The WSCs report that the occurrence of floods on major streets has decreased significantly since project completion. Implementation of the PEEP contributed to enhanced public awareness of hygiene and sanitation, and it induced communities to properly dispose of wastewater and solid waste.

#### C. Efficiency in Achieving Outcome and Outputs

40. The Project was less efficient in financial and economic terms. The overall financial internal rate of return (FIRR) for the seven project towns was 7.7%. Except for Qui Nhon and Tuyen Quang, the recalculated FIRRs were higher than those estimated at appraisal. For Dong Hoi, it was 6.8%

compared to the forecast 6.4%. For Vinh it was 10.8% (versus 6.2%) and for Ben Tre 8.6% (rather than 3.4%). These towns have higher levels of water tariffs and house connections. Lower FIRR were noted for Tuyen Quang (5.1% versus 7.4% forecast) and for Qui Nhon (5.2% versus 6.6%), mainly due to lower water tariffs and high O&M costs. The sensitivity analysis indicates that FIRR is more sensitive to reduced revenues than to increased O&M and project costs.

41. The assessment of the financial performance of the WSCs shows that, if water tariffs are kept at current levels, almost all the WSCs cannot afford to fully repay the debt on the investments, as no subsidy will be made from provincial governments starting from December 2006. A new Government decree<sup>21</sup> requires that all the WSCs shall be limited companies and financially autonomous, thus responsible for debt repayment and amortization. Most WSCs plan to increase water tariffs from 2006 to 2010 by as much as 30% to 90% for all categories of consumers in order to meet the required debt-service coverage target. For example, Tuyen Quang proposes an average tariff rate per cubic meter of D2,581 (increased by 32% from the current rate). At Dong Ha a 40% rise to D4,300 is proposed. Dong Hoi proposes a rise to D5,745 (by 90%) and Ninh Binh to D5,585 (by 97%). With the new rates, the Ben Tre, Ninh Binh, and Qui Nhon WSCs will have sufficient liquidity to repay the debt. The proposed tariffs for Dong Ha, Dong, Hoi Tuyen Quang, and Vinh are insufficient and need to be another 20% to 30% higher than the rates currently proposed.

42. Economic efficiency was analyzed based on the social and economic benefits accrued from upgrading and rehabilitating water supply systems. These benefits include (i) the significant reduction in NRW from 40% to less than 30%, (ii) the reduction in the cost of purchasing and treating water from alternative sources, and (iii) the resource cost savings from the construction and maintenance of storage facilities and time savings associated with water collection. The recalculated EIRRs ranged from 13.29% to 22.93%. This shows that the EIRRs of all project towns are higher than the standard economic opportunity cost of capital (12%) and are also higher than EIRRs (11.4% to 20.9%) estimated at appraisal. The higher recalculated EIRRs are mainly due to the lower project costs and higher water consumption. Tuyen Quang town has the highest EIRR of 22.9%, as the improved water supply system created more benefits for the population, which had previously spent more time and money to obtain clean water before the Project. Dong Ha has an EIRR of 13.3%, much lower than Tuyen Quang, as its new water treatment plant is operated at about 50% of its design production capacity.

#### **D. Preliminary Assessment of Sustainability**

43. The Project is assessed as likely to be sustainable. Except for Tuyen Quang (see footnote 5), all project facilities provided for water supply and sanitation systems under the Project are fully operational on a sustainable basis. The water supply systems currently operate at rates lower than their design capacities in most of the towns, as they are designed for the target year of 2011. Of the seven project towns, Ben Tre, Dong Ha, Qui Nhon, and Tuyen Quang explored groundwater as a source of raw water, while Dong Hoi, Ninh Binh, and Vinh take water from a river or a lake. The intake facilities including pumping equipment are fully operational. All the water treatment plants are also functioning well and the treated water meets the national quality standards. Transmission and distribution systems are also working well. Distribution systems were augmented to extend services to new areas. WSC staff were increased to ensure proper operation of the new water supply works and to expand distribution networks for new consumers. Computerized billing and maintenance management system are effective. The Project has achieved an increased level of services, with treated water supplied 24 hours a day at a better quality and high pressure.

<sup>21</sup> Government Decree No. 145/2005/ND-CP, dated 21 November 2005, stipulates that all state-owned companies, including water supply companies, shall be limited or incorporated.



44. Financial performance at all the WSCs has improved, as better water supply systems under the Project have contributed savings in operational costs and reduced NRW. The staffing ratio has improved to less than 1 per 1,000 connections in almost all the WSCs. Nevertheless, most are yet unable to generate sufficient revenues to recover all operating and maintenance costs plus interest charges, depreciation, and debt service. A low level of water tariffs is the major reason. The tariff adjustments currently proposed by each WSC should be approved by the PPCs for introduction during 2006 and 2007. Another increase of 20-40% above the proposed tariffs should be made for some towns in 2008 to generate revenues for full cost recovery and loan repayment. Tariffs should be continuously adjusted to ensure the WSCs operate their businesses on a sustainable basis.

45. Improved drainage and sanitation systems are maintained by the urban public works and environment company (UPWEC) under the municipal government, and they are functioning well. The improved systems will help reduce floods and threats to aquatic ecosystems from urban water pollution. UPWEC also has satisfactorily undertaken septic tank cleaning services.

## **E. Impact**

46. The Project encountered no major adverse environmental, social, or cultural impacts during implementation. Inconvenience to people due to construction works was insignificant. Improved water supply systems have significantly benefited much of the population, including hospitals, schools, and other public institutions. Especially benefiting will be low-income people who had no access to safe water before the Project. Incidences of waterborne diseases and infant mortality will decline with provision of safe water to increased numbers of beneficiaries.

47. Installation of drainage pipes and cleaning of existing drain systems will help reduce flooding in the centers of the project towns. Improved household toilets with septic tanks will significantly benefit low-income households<sup>22</sup> through improved sanitation and living environments. People are now well sensitized to the benefits of improved water and sanitation due to the PEEP.

48. Minor land acquisition and resettlements occurred in Ben Tre, Dong Ha, Dong Hoi, Qui Nhon, and Vinh. The PPIOs had prepared resettlement plans before works commenced. Only 14 households—six in Ben Tre, seven in Dong Hoi, and one in Vinh—were resettled in nearby areas. The PPIOs took steps to ensure that acquisition of land, land rights, or right-of-way adhered to both Government and ADB resettlement procedures. In Ben Tre and Qui Nhon, adjustments in pipe alignment were required, because of the highway authority's decision to widen the national roads. That created a need to acquire land. The PPCs responsible for financing land acquisition and compensation spent several months in consultation to reach agreements with affected households, although this caused delays in land acquisition and contractor's works. The costs of land acquisition and compensation for resettlements were basically paid by the PPCs. These totaled about \$856,000 equivalent, comprising \$276,000 equivalent for land acquisition and \$580,000 equivalent for compensation, as shown in Appendix 7. No issues relating to indigenous people issues arose either during project design or implementation.

## **IV. OVERALL ASSESSMENT AND RECOMMENDATIONS**

### **A. Overall Assessment**

49. Overall, the Project was successful. The Project achieved its outputs and outcomes as envisaged at appraisal. The delays in implementation and a 3 year extension for loan closing were

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<sup>22</sup> Of 14,170 households that installed septic tanks, about 13,000 belong to the low-income category.

basically due to failure to award contracts for major civil works according to schedule as a result of rebidding and bid evaluation, which was scarcely manageable and avoidable. The WSCs are technically fully operational and expanding access to safe water to the remaining town areas. As of July 2006, the population served with safe water ranges from 63% to 87% in the project towns. With WSCs' continued efforts in expanding distribution networks and house connections, it is expected that the population served ratio will essentially reach 100% in all the seven project towns by 2011, as originally envisaged. Improved sanitation and drainage systems will contribute to improved urban environments with reduced incidences of waterborne diseases and threats to aquatic ecosystem from urban water pollution. A qualitative assessment of overall project performance is in Appendix 8.

## **B. Lessons**

50. Based on the assessment of the Project, the following lessons were learned:

- (i) Training workshops prior to project implementation are needed to familiarize staff of project implementation offices at local level with ADB procedures for selecting consultants, procurement, and disbursement.
- (ii) Each procurement package should be established in such size that bidding will be competitive among qualified contractors, while also trying to minimize the number of contract packages to lessen the executing agency's workload for controlling contractors and suppliers.
- (iii) Engaging two teams of consultants to manage implementation of a project is ineffective, even if project sites are geographically spread, as staffing will be duplicated in some positions (including that of team leader).
- (iv) The project implementation schedule should be established taking fully into account the Government's approval procedures that require approval of higher authorities for feasibility studies, project budgets, the bid plan, bidding documents, bid evaluation, and contract awards. At the time of project preparation, delegation of approval authorities for critical activities to the lower levels should be discussed and agreed.
- (v) The WSCs that will be the end users of completed project facilities and responsible for repayment of the loan should be party to the contracts with contractors, such that the WSCs and PPIOs are authorized to supervise or control the performance of the contractors and suppliers.
- (vi) The consultants, including foreign experts, should be retained until the entire system is in operation and commissioning tests have been completed so that they will be held responsible for assessing the final outcome, including the quality of works, and for proposing corrective measures for defective works or shortages, if any.
- (vii) Advance action for land acquisition and resettlement should be required, as consultation and agreements with affected households can take a very long time.

## **C. Recommendations**

### **1. Project-Related**

51. **Future Monitoring.** The CPMU instructs all PPIOs to formally hand over the completed project facilities to the WSCs as soon as possible while following the Government's prescribed procedures.

52. **Covenants.** (i) The agency responsible for drainage and septic tank cleaning services varies depending on province. Qui Nhon WSC is not currently responsible for this, but will be mandated that responsibility starting in October 2006. Meanwhile, the UPWEC under the municipal government is responsible for the services in the other towns. A clear government instruction or

decree is needed to promulgate which entity is responsible, so that a uniform approach can be taken to improve the services. (ii) All the WSCs should continue to adjust the water tariffs, without political intervention, in order to meet the financial targets that including the debt-service ratio, given that the WSC is now a limited company without government financial support.

53. **Future Action or Follow-Up.** (i) Tuyen Quang needs to initiate installation of groundwater treatment facilities to remove iron and manganese. The installation of cascade aerators and sand filters is recommended, as these are proven to function well in Ben Tre and Dong Ha. (ii) Continued extension of the drainage system is needed to enable all households to discharge their wastewater into the drainage system. (iii) All the WSCs need to commence preparation of ensuing projects to meet the increasing demands beyond 2011, as a minimum of 5 years will be needed from preparation of feasibility study to the completion of a project. In particular, Qui Nhon needs to take immediate action for expanding its water production facilities, as the demand increase in the industrial sector is growing faster than anticipated.

54. **Additional Assistance.** Partial privatization is under consideration by the Dong Ha WSC, to initially let the private sector operate the raw water intake and transmission system, and thereafter water treatment and distribution facilities. The Government should provide necessary guidance and assistance to support these initiatives.

55. **Timing of the Project Performance Evaluation Report.** Preparation of the performance evaluation will be in 2008 or 2009, when the impact of introducing new tariff rates will become significant.

## 2. General

56. General recommendations are as follows:

- (i) Careful planning of cost estimates and the implementation schedule during project preparation should be undertaken to avoid unnecessary implementation delays, taking into account the time needed to obtain government approval for changes.
- (ii) Government approval procedures should be streamlined and authority further delegated to line ministers and end users in line with government decentralization policy. That will help expedite project implementation. In particular, the complicated bid evaluation mechanism needs to be changed through discussions with higher government authority.
- (iii) Groundwater is exploited with minimal control by provincial governments. Government regulations to control water sources should be strengthened to protect groundwater from illegal exploitation and pollution.
- (iv) Highest priority should be given to selecting consultants who are familiar with local rules and regulations related to project implementation. The foreign consultants should be retained until completion of the commissioning test.
- (v) Use of a lump sum contract with fixed contract price will discourage contractors from continuing and completing the works when extra works or time are required but were not anticipated by the contractor at the time of signing of the contract. Use of a unit price cost contract should be considered when complex works are contracted.

## PROJECT FRAMEWORK

Design Summary	Performance Indicators/ Targets	Project Achievements	Key Issues and Recommendation
<b>Impacts</b>  Improved public health and urban environment	<ul style="list-style-type: none"> <li>By 2011, 100% of the urban and suburban population will have access to adequate fresh water supplied by the water supply companies (WSCs). Eighty percent of consumers will be supplied through individual metered connections and 20% through metered public standpipes.</li> <li>Substantial declines achieved in the incidence of waterborne disease and infant mortality.</li> <li>Substantial reductions achieved in the threats to aquatic ecosystems from urban water pollution.</li> </ul>	<ul style="list-style-type: none"> <li>As of July 2006, population served is estimated at 75% in Tuyen Quang, 87% in Ninh Binh, 72% in Vinh, 64% in Dong Hoi, 82% in Dong Ha, 63% in Qui Nhon, and 85% in Ben Tre. Standpipe services were eliminated.</li> <li>No quantitative data available, but likely to be achieved as a result of improved access to safe water for a larger part of the population.</li> <li>Flooding incidence and threats to aquatic ecosystems likely to be reduced by improved sanitation and wastewater management.</li> </ul>	<ul style="list-style-type: none"> <li>WSCs need to continue the extension of distribution pipelines and installation of house connections.</li> <li>WSCs, with cooperation of the urban public work and environmental companies (UPWECS) continue to improve sanitation and drainage systems in the towns.</li> </ul>
<b>Outcomes</b>  Enhanced public awareness of hygiene and sanitation	<ul style="list-style-type: none"> <li>Continuing public involvement in the planning, design, and implementation of the project towns' public water supply and sanitation systems.</li> <li>Widespread public support for WSCs as evidenced by the adoption of tariffs for full cost recovery.</li> </ul>	<ul style="list-style-type: none"> <li>Communities, including Vietnam Women's Union (VWU), continuously involved in water supply and sanitation activities.</li> <li>With support of public, including provincial people committees (PPCs), tariff rates have been adjusted continuously, but are not yet insufficient.</li> </ul>	<ul style="list-style-type: none"> <li>WSCs continue to involve communities in planning, designing, and implementing ensuing projects.</li> <li>WSCs continue efforts to make tariff adjustments, taking into account beneficiaries' willingness to pay.</li> </ul>
Improved access to safe water	<ul style="list-style-type: none"> <li>Average domestic consumption of fresh water increased to 100 liters per capita per day (lpcd) in urban and</li> </ul>	<ul style="list-style-type: none"> <li>Average domestic water consumption is estimated as 92 lpcd in Tuyen Quang, 82 lpcd in Ninh Binh, 120 lpcd</li> </ul>	<ul style="list-style-type: none"> <li>WSCs continue to improve distribution systems and constantly supply pressurized water to</li> </ul>

Design Summary	Performance Indicators/ Targets	Project Achievements	Key Issues and Recommendation
	<p>suburban areas of project towns.</p> <ul style="list-style-type: none"> <li>Project towns' nonrevenue water (NRW) (due to leakage, faulty meters, etc.) reduced from 33-57% in 1996 to less than 35% by 2002. (Note: The industry standard should be lower, perhaps 20-25%.)</li> <li>Town water supply systems continue to receive adequate periodic and special maintenance during and beyond the project implementation period.</li> </ul>	<p>in Vinh, 135 lpcd in Dong Hoi, 110 lpcd in Dong Ha, 88 lpcd in Qui Nhon and 100 lpcd in Ben Tre.</p> <ul style="list-style-type: none"> <li>NRW is improved as follows: 28% in Tuyen Quang, 30% in Ninh Binh, 25% in Vinh, 25% in Dong Hoi, 26% in Dong Ha, 30% in Qui Nhon, and 21% in Ben Tre.</li> <li>Except for Tuyen Quang, the water supply systems in all the other six towns are well maintained.</li> </ul>	<p>consumers to achieve the targeted per capita consumption of 100 lpcd by 2011.</p> <ul style="list-style-type: none"> <li>WSCs continue the improvement of distribution systems and replacement of faulty water meters.</li> <li>Tuyen Quang WSC needs to take prompt actions to address its groundwater problem, such as to install iron and manganese removal facilities.</li> </ul>
<p>Improved urban environment</p> <p>Strengthened existing sector institutions</p>	<ul style="list-style-type: none"> <li>Flooding incidence reduced.</li> <li>Existing sector institutions are strengthened in respect of financial and maintenance management.</li> <li>Project towns' WSCs achieve full cost recovery, including adequate income to ensure continuing system operation and maintenance (O&amp;M) and upgrades.</li> <li>Policy reform to enforce improved sanitation standards is effective.</li> </ul>	<ul style="list-style-type: none"> <li>Likely being reduced with the improved drainage system, but impact varies by town as investment in this category was limited.</li> <li>Installation of computerized billing and operation monitoring systems and training of WSC staff resulted in improved financial and maintenance management.</li> <li>Project towns' WSCs were yet to achieve full cost recovery, including adequate income to ensure continuing system O&amp;M and upgrades.</li> <li>MOC and provincial regulations to enforce installation of septic</li> </ul>	<ul style="list-style-type: none"> <li>UPWECs in each province continue the improvement of drainage and sanitation systems.</li> <li>WSCs continuously update the monitoring systems and conduct training of staff concerned with effective use of the systems.</li> <li>WSCs continuously adjust tariffs to maintain adequate financial position.</li> <li>Local regulations, where missing, issued to require all households to install septic tanks, to supplement Ministry of Construction (MOC) regulations, if necessary.</li> </ul>

Design Summary	Performance Indicators/ Targets	Project Achievements	Key Issues and Recommendation
		tanks are effective in almost all towns.	
<b>Outputs</b>			
<b>Part A:</b> Public Environmental Education Program	<ul style="list-style-type: none"> <li>Communities are sensitized to the benefits of improved water and sanitation facilities.</li> <li>Beneficiaries actively engaged in project design and implementation.</li> </ul>	<ul style="list-style-type: none"> <li>People were overwhelmingly involved in PEEP program in all the project towns and were well sensitized.</li> <li>Beneficiaries were invited to discuss project design and implementation during workshops.</li> </ul>	<ul style="list-style-type: none"> <li>PEEP activities be continued by provincial governments to maintain the momentum.</li> <li>WSCs continue to involve beneficiaries in their activities.</li> </ul>
<b>Part B:</b> Water Supply Systems Development in the Project Towns	<ul style="list-style-type: none"> <li>Unpolluted water sources and adequate yields are secured in all the project towns.</li> <li>Water treatment plants rehabilitated and upgraded, and distribution systems rehabilitated and extended, to serve the populations of the project towns.</li> <li>Treatment plants with adequate capacity are operational.</li> <li>Pumping stations with improved electrical and mechanical equipment are operational.</li> <li>Distribution systems with adequate capacity are operational.</li> <li>Installation of 81,000 house connections. Population served increased from 30%–50% in 1997 to 74% in 2005.</li> </ul>	<ul style="list-style-type: none"> <li>Except for Tuyen Quang, all the other towns secured adequate sources of water until 2011.</li> <li>Water treatment plants upgraded and/or new water treatment facilities constructed in all the towns to meet the growing demand until 2011. Distribution systems extended and are being developed where needs arise.</li> <li>Except Tuyen Quang, all the treatment plants are satisfactory and operational.</li> <li>Pumping stations and distribution systems are fully operational. They will be expanded as need arises.</li> <li>House connections newly installed amounted to a total of 62,000 in the seven towns. Population served ratio in the project towns increased to 63–87% in 2005.</li> </ul>	<ul style="list-style-type: none"> <li>Tuyen Quang must explore new sources as groundwater developed under the Project is inadequate.</li> <li>WSCs initiate expansion of production facilities to meet the growing demand after 2011.</li> <li>WSCs continue expansion of distribution systems to achieve the targeted population served (i.e., 100% by 2011).</li> <li>House connections need to be accelerated to achieve the targeted population served by 2011.</li> </ul>
<b>Part C:</b> Environmental	<ul style="list-style-type: none"> <li>17,000 septic tanks are</li> </ul>	<ul style="list-style-type: none"> <li>14,170 septic tanks</li> </ul>	<ul style="list-style-type: none"> <li>UPWECs will closely</li> </ul>

Design Summary	Performance Indicators/ Targets	Project Achievements	Key Issues and Recommendation
Sanitation Improvements	<p>installed. Sullage and septic tanks are connected to drainage systems where available.</p> <ul style="list-style-type: none"> <li>The combined drainage systems are improved, extended and become functional.</li> <li>A new set of regulations to enforce improved sanitation standards is introduced.</li> </ul>	<p>were installed and are connected to the drainage system where available.</p> <ul style="list-style-type: none"> <li>The combined drainage systems were improved, extended and became functional.</li> <li>New regulations to enforce improved sanitation standards introduced in most towns while the MOC regulations prevail in some other towns.</li> </ul>	<p>monitor and assist residents in installing septic tanks.</p> <ul style="list-style-type: none"> <li>UPWECs will adequately maintain and keep functional the drainage system.</li> </ul>
<b>Part D:</b> Implementation Assistance and Institutional Strengthening	<ul style="list-style-type: none"> <li>CPMU and PPIOs for project implementation were fully functional and operational.</li> <li>The capacity of the WSCs in the areas of O&amp;M, pipelaying, financial management, maintenance, and sanitation works is strengthened with provision of training, equipment, and vehicles.</li> <li>Water tariffs initially (1997) brought in line with the National Water Supply Tariff Study and then adjusted annually to allow full cost recovery.</li> </ul>	<ul style="list-style-type: none"> <li>CPMU and PPIOs were functional and operational during project implementation.</li> <li>The capacity of the WSCs was strengthened in general as originally envisaged.</li> <li>As of June 2006, water tariffs were: D1,955 for Tuyen Quang, D2,835 for Ninh Binh, D3,780 for Vinh, D3,023 for Dong Hoi, D3,071 for Dong Ha, D2,300 for Qui Nhon, and D2,300 for Ben Tre.</li> </ul>	<ul style="list-style-type: none"> <li>WSCs formulate training programs and build capacity on a sustainable basis.</li> <li>WSCs are entitled to adjust water tariffs to meet their financial targets.</li> </ul>

Activities (Planned)	Activities (Actual)
<p><b>Part A: Public Environmental Education Program (PEEP)</b></p> <ul style="list-style-type: none"> <li>Design townwide community health and hygiene education programs, and amend the programs to be used on a sustainable basis after Project. (Q2 and Q3 of 1997).</li> <li>Implement the PEEP (i) to sensitize the beneficiaries to the interdependency between</li> </ul>	<p><b>Part A: Public Environmental Education Program</b></p> <ul style="list-style-type: none"> <li>Townwide community health and hygiene education programs were well designed and amended to suit local conditions. (in Q3 of 1998).</li> <li>The PEEP was implemented successfully in all project towns as originally envisaged. Among the</li> </ul>

Activities (Planned)	Activities (Actual)
<p>their water use and sanitation behavior and the condition of the environment and their health condition, (ii) explain their participatory role in helping to achieve the objectives, (iii) explain the beneficiaries' responsibilities if the objective is to be sustained, and (iv) actively engage the beneficiaries in the design and implementation of the Project.</p> <p>(Q3 of 1997 to Q4 of 2001).</p>	<p>seven, Qui Nhon was most enthusiastic and successful. PEEP activities included orientation workshops, group meetings to train motivators, procurement of equipment for public education, street marching by communities including VWU and nongovernment organizations, creating and broadcasting videos on safe water and sanitation, advertising, routine letters and arts activities such as painting and writing contests for schoolchildren. Local authorities and public organizations including PPCs and ward communist parties were also mobilized.</p> <p>(Package A: Q4 of 1998 to Q3 of 2001) (Package B: Q4 of 1998 to Q4 of 2004)</p>
Part B: Water Supply Systems Development	Part B: Water Supply Systems Development
<p><b>Tuyen Quang</b></p> <p>ICB/LCB Contracts (Q1 of 1998 – Q4 of 2001)</p> <p>(iv) Upgrade existing boreholes and pumping station.</p> <p>(ii) Construct new raw water transmission pipelines.</p> <p>(iii) Rehabilitate existing water treatment plant (WTP), with actual production of about 4,000 m<sup>3</sup>/day.</p> <p>(ii) Construct a new WTP with capacity of 12,500 m<sup>3</sup>/day.</p> <p>(v) Construct ground level water storage, as well as transmission and distribution mains.</p> <p>Force Account (Q3 of 1998 – Q2 of 2001)</p> <p>(vi) Install 11,000 house connections.</p> <p>(vii) Rehabilitate part of existing combined drainage system.</p> <p>(viii) Strengthen Tuyen Quang WSC.</p>	<p><b>Tuyen Quang</b></p> <p>ICB/LCB Contracts (Q3 of 2002 – Q1 of 2005)</p> <p>(viii) Eleven new boreholes with associated pumping stations constructed.</p> <p>(ii) Installed 3.5 km of 150-500 mm raw water pipes.</p> <p>(iii) Existing WTP rehabilitated and upgraded to produce 12,500 m<sup>3</sup>/day.</p> <p>(iv) No new WTP constructed, but new administration building, workshop, pumping station, and laboratory were constructed to serve the upgraded existing WTP.</p> <p>(ix) New 1,000 m<sup>3</sup> storage, as well as 23.4 km of transmission and distribution pipes constructed.</p> <p>Force Account (Q1 of 2002 – Q4 of 2003)</p> <p>(x) Installed were 8,656 house connections.</p> <p>(xi) Rehabilitated were 5.45 km of drainage system.</p> <p>(viii) Equipment provided and training conducted as envisaged.</p>
<p><b>Ninh Binh</b></p> <p>ICB/LCB Contracts (Q1 of 1998 – Q4 of 2001)</p> <p>(xii) Upgrade existing raw water intake and construct a new raw water intake and pumping station.</p> <p>(ii) Rehabilitate existing WTP, with actual production of 7,000 m<sup>3</sup>/day and a clear water pumping station.</p> <p>(xiii) Construct a new WTP with capacity of 10,000 m<sup>3</sup>/day.</p> <p>(iv) Construct ground level water storage, as well</p>	<p><b>Ninh Binh</b></p> <p>ICB/LCB Contracts (Q3 of 2002 – Q1 of 2005)</p> <p>(xv) New intake structure with new pumping equipment constructed.</p> <p>(ii) Existing WTP rehabilitated to recover the nominal capacity of 10,000 m<sup>3</sup>/day.</p> <p>(xvi) New WTP (10,000 m<sup>3</sup>/day) constructed as envisaged.</p> <p>(iv) New 2,000 m<sup>3</sup> storage constructed and 13.14 km of pipelines installed.</p> <p>Force Account (Q4 of 2001 – Q2 of 2005)</p>



Activities (Planned)	Activities (Actual)
<p>as transmission and distribution mains (41.0 km). Force Account (Q3 of 1998 – Q2 of 2001)</p> <p>(xiv) Install 5,000 house connections.</p> <p>(ii) Strengthen the Ninh Binh WSC.</p>	<p>(xvii) Installed were 1,800 house connections.</p> <p>(ii) Equipment provided and training conducted as envisaged.</p> <p>(vii) Installed were 33.6 km of tertiary pipes (50–80 mm).</p>
<p><b>Vinh</b></p> <p>ICB/LCB Contracts (Q1 of 1998 – Q4 of 2001)</p> <p>(xviii) Construct a new raw water intake and pumping station.</p> <p>(ii) Construct a raw water transmission pipeline.</p> <p>(iii) Rehabilitate existing WTP with actual production of 18,000 m<sup>3</sup>/day.</p> <p>(iv) Construct a new WTP with capacity of 40,000 m<sup>3</sup>/day.</p> <p>(xix) Construct ground level water storage, as well as transmission and distribution mains.</p> <p>Force Account (Q3 of 1998 – Q2 of 2001)</p> <p>(xx) Install 20,000 house connections.</p> <p>(xxi) Strengthen the Vinh WSC.</p>	<p><b>Vinh</b></p> <p>ICB/LCB Contracts (Q3 of 2002 – Q4 of 2004)</p> <p>(xxii) New raw water intake and pumping station constructed with 2,700 m<sup>3</sup>/hr capacity.</p> <p>(ii) Constructed 5.84 km of 700 mm pipeline.</p> <p>(iii) Existing WTP rehabilitated to recover the nominal production capacity of 20,000 m<sup>3</sup>/day.</p> <p>(iv) Constructed new WTP with capacity of 40,000 m<sup>3</sup>/day.</p> <p>(xxiii) Installed new 8,000 m<sup>3</sup> storage reservoir and 58.74 km of pipes (80–600 mm).</p> <p>Force Account (Q2 of 2003 – Q4 of 2004)</p> <p>(xxiv) Installed 14,206 house connections.</p> <p>(xxv) Equipment and training provided as envisaged.</p> <p>(viii) Installed 134.67 km of tertiary pipes (50–90 mm).</p>
<p><b>Dong Hoi</b></p> <p>ICB/LCB Contracts (Q1 of 1998 – Q1 of 2001)</p> <p>(xxvi) Upgrade existing water intake and pumping station at Bau Tro Lake.</p> <p>(ii) Construct a new raw water pumping station at Phu Vinh reservoir.</p> <p>(iii) Construct a raw water transmission pipeline (500 m).</p> <p>(iv) Upgrade existing WTP with actual production of 4,000 m<sup>3</sup>/day, as well as clear water pumping station.</p> <p>(xxvii) Construct a new WTP with capacity of 18,000 m<sup>3</sup>/day.</p> <p>(ii) Construct ground level water storage, as well as distribution mains (84,000 m).</p> <p>Force Account (Q1 of 1999 – Q2 of 2001)</p> <p>(xxviii) Install 12,500 house connections.</p> <p>(viii) Strengthen the Dong Hoi WSC.</p>	<p><b>Dong Hoi</b></p> <p>ICB/LCB Contracts (Q4 of 2002 – Q2 of 2005)</p> <p>(xxix) Dredging and cleaning the Bau Tro Lake basin.</p> <p>(ii) Pumping station refurbished and pumping equipment installed at Phu Vinh reservoir.</p> <p>(iii) Constructed 365 m of raw water pipeline (500 mm diameter).</p> <p>(iv) Mechanical and electrical upgrading of WTP to the nominal production capacity of 9,000 m<sup>3</sup>/day and rehabilitation of reservoir undertaken.</p> <p>(xxx) new WTP (19,000 m<sup>3</sup>/d) constructed.</p> <p>(ii) Two reservoirs (2,000 m<sup>3</sup> each) constructed and 57.24 km of distribution mains constructed.</p> <p>Force Account (Q3 of 2002 – Q2 of 2005)</p> <p>(xxxi) Installed 5,979 house connections.</p> <p>(xxxii) Equipment provided and training conducted as envisaged.</p> <p>(ix) Installed 45.78 km of tertiary pipes (15–100 mm).</p>

Activities (Planned)	Activities (Actual)
<p><b>Dong Ha</b> ICB/LCB Contracts (Q1 of 1998 – Q1 of 2001)</p> <ul style="list-style-type: none"> <li>(xxxiii) Upgrade a raw water intake and pumping station.</li> <li>(ii) Develop new bores and pumping station.</li> <li>(iii) Construct well link and raw water transmission pipelines (15,000 m).</li> <li>(iv) Rehabilitate existing WTP with actual production of 7,500 m<sup>3</sup>/day.</li> <li>(xxxiv) Construct a new groundwater sourced WTP (15,000 m<sup>3</sup>/day).</li> <li>(ii) Construct ground level water storage and distribution mains (71,000 m).</li> </ul> <p>Force Account (Q1 of 1999 – Q2 of 2001)</p> <ul style="list-style-type: none"> <li>(xxxv) Install 12,000 house connections.</li> <li>(viii) Strengthen the Dong Ha WSC.</li> </ul>	<p><b>Dong Ha</b> ICB/LCB Contracts (Q4 of 2002 – Q2 of 2005)</p> <ul style="list-style-type: none"> <li>(xxxvi) Existing raw water intake and pumping station at the Vinh Phuoc River upgraded.</li> <li>(ii) Constructed 11 boreholes and pumping stations.</li> <li>(iii) Well link and raw water transmission mains (16.98 km) constructed.</li> <li>(iv) Existing WTP rehabilitated and upgraded to the capacity of 15,000 m<sup>3</sup>/day.</li> <li>(xxxvii) New groundwater sourced WTP (15,000 m<sup>3</sup>/d) constructed.</li> <li>(ii) Two reservoirs (1,000 m<sup>3</sup> in total) and 77.64 km of distribution mains constructed.</li> </ul> <p>Force Account (Q4 of 2002 – Q2 of 2005)</p> <ul style="list-style-type: none"> <li>(xxxviii) Installed 2,200 house connections, all with water meters.</li> <li>(xxxix) Equipment and training provided as envisaged.</li> <li>(ix) Installed 30.9 km of tertiary pipes (15–80mm).</li> </ul>
<p><b>Quy Nhon</b> ICB/LCB Contracts (Q2 of 1998 – Q3 of 2001)</p> <ul style="list-style-type: none"> <li>(xl) Upgrade existing bore hole pumping station with actual production of 14,000 m<sup>3</sup>/day.</li> <li>(ii) Develop new bore holes.</li> <li>(iii) Construct raw water transmission pipelines (15,000 m).</li> <li>(iv) Install disinfecting equipment.</li> <li>(xli) Clean and rehabilitate existing reticulation mains (30,000 m).</li> <li>(ii) Construct a ground level storage reservoir and distribution mains (71,000 m).</li> </ul> <p>Force Account (Q2 of 1999 – Q4 of 2001)</p> <ul style="list-style-type: none"> <li>(xlii) Install 15,000 house connections.</li> <li>(viii) Strengthen the Qui Nhon WSC.</li> </ul>	<p><b>Quy Nhon</b> ICB/LCB Contracts (Q4 of 2002 – Q2 of 2005)</p> <ul style="list-style-type: none"> <li>(xlili) Mechanical and electrical upgrading of the bore hole pumping stations conducted.</li> <li>(ii) Constructed two wells for existing WTP and nine wells for new WTP.</li> <li>(iii) Constructed 12.58 km of raw water transmission mains.</li> <li>(iv) Constructed new WTP with capacity of 25,000 m<sup>3</sup>/day.</li> <li>(xliv) Treated water reservoir (4,000 m<sup>3</sup>) and constructed distribution mains (35.8 km).</li> </ul> <p>Force Account (Q4 of 2001 – Q4 of 2004)</p> <ul style="list-style-type: none"> <li>(xlv) Installed 18,595 house connections.</li> <li>(xlvi) Cleaned and rehabilitated 6.6 km of distribution pipes.</li> <li>(xlvii) Installed 90.76 km of tertiary pipes (32–80 mm).</li> <li>(ix) Equipment and training provided as envisaged.</li> </ul>
<p><b>Ben Tre</b> ICB/LCB Contracts (Q2 of 1998 – Q3 of 2001)</p> <ul style="list-style-type: none"> <li>(xlviii) Upgrade raw water intake and pumping station.</li> </ul>	<p><b>Ben Tre</b> ICB/LCB Contracts (Q4 of 2002 – Q2 of 2005)</p> <ul style="list-style-type: none"> <li>(li) Existing raw water intake and pumping station rehabilitated and</li> </ul>

Activities (Planned)	Activities (Actual)
<p>(ii) Develop new well field and pumping station.</p> <p>(iii) Construct a groundwater transmission pipeline (3,700 m).</p> <p>(iv) Rehabilitate and expand existing WTP with nominal capacity of 4,000 m<sup>3</sup>/day to 18,000 m<sup>3</sup>/day.</p> <p>(xlix) Construct a new WTP (10,000 m<sup>3</sup>/day).</p> <p>(ii) Construct ground level storage and distribution mains (53,000 m).</p> <p>Force Account (Q2 of 1999 – Q4 of 2001)</p> <p>(I) Install 15,000 house connections.</p> <p>(viii) Strengthen the Ben Tre WSC.</p>	<p>upgraded with two new pumps.</p> <p>(ii) Constructed 10 well pumping stations.</p> <p>(iii) Constructed 6.76 km of groundwater transmission mains.</p> <p>(iv) Mechanical and electrical upgrading of WTP to the capacity of 18,000 m<sup>3</sup>/day.</p> <p>(lii) New WTP (10,000 m<sup>3</sup>/d) constructed.</p> <p>(ii) Treated water reservoirs (2,000 m<sup>3</sup>) and 31.73 km of distribution mains constructed.</p> <p>Force Account (Q2 of 2002 – Q3 of 2004)</p> <p>(liii) Installed 10,530 house connections.</p> <p>(liv) Equipment and training provided as envisaged.</p> <p>(ix) 6.81 km of tertiary pipes (60–110 mm) installed.</p>
Part C : Environmental Sanitation Improvement	Part C : Environmental Sanitation Improvement
<p><b>Tuyen Quang</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(iv) Rehabilitate part of existing combined drainage system (5.0 km).</p> <p>(ii) Construct 6.7 km of sewers and drains.</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(iii) Provide two septic desludging trucks.</p> <p>(iv) Construct 1,870 septic tanks.</p> <p>(v) Develop an institutional and regulatory framework for O&amp;M of the sanitation works.</p>	<p><b>Tuyen Quang</b></p> <p>Drainage Improvements (Q3 of 1998 – Q4 of 2004)</p> <p>(lvi) Rehabilitated 8.5 km of drainpipes.</p> <p>(ii) Constructed 5.5 km of new sewers and drains.</p> <p>Sanitation Facilities Improvements (Q3 of 1998 – Q4 of 2004)</p> <p>(iii) Provided one desludging truck.</p> <p>(iv) Installed 1,898 septic tanks.</p> <p>(v) New regulation yet to be introduced by the province. A regulation issued by MOC in 2000 is applied.</p>
<p><b>Ninh Binh</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(lvii) Rehabilitate part of existing combined drainage system (10 km).</p> <p>(ii) Construct 7.5 km of large diameter covered sewers and open drains.</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(iii) Provide two septic tank desludging trucks.</p> <p>(iv) Construct 488 septic tanks.</p> <p>(v) Develop an institutional and regulatory framework for O&amp;M of the sanitation works</p>	<p><b>Ninh Binh</b></p> <p>Drainage Improvements (Q3 of 1998 – Q2 of 2004)</p> <p>(lviii) Cleaned and rehabilitated 8.5 km of existing sewer and drains.</p> <p>(ii) Installed 5.2 km of box culverts and pipes.</p> <p>Sanitation Facilities Improvements (Q3 of 1998 – Q3 of 2004)</p> <p>(iii) Provided two desludging trucks.</p> <p>(iv) Installed 598 septic tanks.</p> <p>(v) New regulation yet to be introduced by the province. A regulation issued by MOC in 2000 is applied.</p>
<p><b>Vinh</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(lix) Rehabilitate part of existing</p>	<p><b>Vinh</b></p> <p>Drainage Improvements (Q3 of 1998 – Q2 of 2004)</p> <p>(lxi) No existing drainpipes rehabilitated,</p>

Activities (Planned)	Activities (Actual)
<p>combined drainage system (14 km) and construct new drains (8 km).</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(ii) Provide three septic tank desludging trucks.</p> <p>(Ix) Construct 6,500 septic tanks.</p> <p>(iv) Develop an institutional and regulatory framework for O&amp;M of the sanitation works.</p>	<p>but installed 5.06 km of box culverts and drainage pipes.</p> <p>Sanitation Facilities Improvements (Q3 of 1998 – Q4 of 2004)</p> <p>(ii) Provided two desludging trucks.</p> <p>(Ixi) Installed 8,952 septic tanks.</p> <p>(iv) New regulation yet to be introduced by the province. A regulation issued by MOC in 2000 is applied.</p>
<p><b>Dong Hoi</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(Ixi) Rehabilitate part of existing combined drainage system (9.4 km).</p> <p>(ii) Construct 10 km of open and covered drains.</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(iii) Provide 3 septic tank desludging trucks.</p> <p>(iv) Construct 500 septic tanks.</p> <p>(v) Develop an institutional and regulatory framework for O&amp;M of the sanitation works.</p>	<p><b>Dong Hoi</b></p> <p>Drainage Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(Ixi) Inspected 25 km of existing drainage pipes and rehabilitated 2 km.</p> <p>(ii) Constructed 5.5 km of concrete pipes.</p> <p>Sanitation Facilities Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(iii) One desludging truck provided and transferred to the urban drainage company.</p> <p>(iv) Installed 250 septic tanks.</p> <p>(v) New regulation introduced in April 2006.</p>
<p><b>Dong Ha</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(Ixv) Rehabilitate part of existing combined drainage system (4.7 km).</p> <p>(ii) Construct 10 km of combined drains.</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(iii) Provide three septic tank desludging trucks.</p> <p>(iv) Construct 305 septic tanks.</p> <p>(v) Develop an institutional and regulatory framework for O&amp;M of the sanitation works.</p>	<p><b>Dong Ha</b></p> <p>Drainage Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(Ixvi) Rehabilitated 7.78 km of existing drainage system and cleaned 3.5 km of pipes.</p> <p>(ii) Installed 8.46 km of box culverts and concrete pipe.</p> <p>Sanitation Facilities Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(iii) Provided one desludging truck.</p> <p>(iv) Installed 344 septic tanks.</p> <p>(v) New regulation introduced in 1998.</p>
<p><b>Qui Nhon</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(Ixvii) Rehabilitate part of existing combined drainage system (10 km).</p> <p>(ii) Construct 14 km of large diameter drains.</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(Ixviii) Provide five septic tank desludging trucks.</p> <p>(Ixix) Construct 939 septic tanks.</p> <p>(iv) Develop an institutional and regulatory framework for O&amp;M of the sanitation works.</p>	<p><b>Qui Nhon</b></p> <p>Drainage Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(Ixx) Rehabilitated 6.1 km of existing combined drainage system.</p> <p>(ii) Constructed 8.2 km of new drains.</p> <p>Sanitation Facilities Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(Ixxi) Provided one desludging truck.</p> <p>(Ixxii) Installed 940 septic tanks.</p> <p>(iv) New regulation yet to be introduced by the province. A regulation issued by MOC in 2000 is applied.</p>

Activities (Planned)	Activities (Actual)
<p><b>Ben Tre</b></p> <p>Drainage Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(lxxiii) Rehabilitate part of existing combined drainage system (12 km).</p> <p>(ii) Construct 6 km of new drains.</p> <p>(lxxiv) Construct 3 km of large diameter sewers.</p> <p>Sanitation Facilities Improvements (Q4 of 1997 – Q4 of 2001)</p> <p>(lxxv) Provide three septic tank desludging trucks.</p> <p>(lxxvi) Construct 865 septic tanks.</p> <p>(lxxvii) Develop an institutional and regulatory framework for O&amp;M of the sanitation works.</p> <ul style="list-style-type: none"> <li>• Provide loan facility for (i) 1,908 households without sanitation facilities, (ii) 3,640 households with inadequate septic tanks, and (iii) 10,765 households with inadequate latrines. (Q4 of 1997 – Q4 of 2001).</li> </ul>	<p><b>Ben Tre</b></p> <p>Drainage Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(lxxviii) Rehabilitated 11 km of existing drainage system.</p> <p>(ii) Constructed 1.21 km of small drains.</p> <p>(lxxix) Installed 6.96 km of large diameter drainpipes.</p> <p>Sanitation Facilities Improvements (Q2 of 2000 – Q4 of 2004)</p> <p>(lxxx) Provided three desludging trucks.</p> <p>(lxxxi) Installed 1,201 septic tanks.</p> <p>(lxxxii) new regulation introduced in 2002.</p> <ul style="list-style-type: none"> <li>• Loan provided for all 14,170 households constructing septic tanks. No breakdown of households was available, as no survey was conducted. (Q4 of 1997 – Q4 of 2001)</li> </ul>
<p><b>Part D: Implementation Assistance and Institutional Strengthening</b></p> <ul style="list-style-type: none"> <li>• Support to CPMU, PPIOs and WSCs with 1,398 person-months of consulting services (180 international and 1,218 national), for detailed design, construction supervision, public environmental education, and institutional strengthening for O&amp;M of water supply and sanitation facilities. (Q2 of 1997 – Q4 of 2001).</li> <li>• In-country training (Q3 of 1997 – Q2 of 2001).</li> <li>• On-the-job training (Q3 of 1997 – Q4 of 2001).</li> <li>• Computerization of financial and maintenance management systems of the WSCs. (Q1 of 1998 – Q4 of 1999)</li> <li>• Procurement of institutional support equipment and vehicles (Q1 of 1997 – Q4 of 2001).</li> </ul>	<p><b>Part D: Implementation Assistance and Institutional Strengthening</b></p> <ul style="list-style-type: none"> <li>• Support to CPMU/PPIOs and WSCs with 1,395 person-months of consulting services (180 international and 1,218 domestic), for detail design, construction supervision, public environmental education, and institutional strengthening for O&amp;M of water supply and sanitation facilities. (Package A: Q2 of 1997 – Q4 of 2004) (Package B: Q2 of 1997 – Q2 of 2005)</li> <li>• In-country training (Q3 of 1998 – Q4 of 1998).</li> <li>• On-the-job training (Q2 of 1997 – Q4 of 2004).</li> <li>• Computerization of financial and maintenance management systems of the WSCs. (Q1 of 1998 – Q4 of 1999)</li> <li>• Procurement of institutional support equipment and vehicles (Q4 of 1998 – Q4 of 2004).</li> </ul>

Inputs (at Appraisal)		Inputs (Actual)	
<b>Asian Development Bank</b>	<b>\$69.00 million</b>	<b>Asian Development Bank</b>	<b>\$59.27 million</b>
Part A: Public Environmental Program	\$0.72 million	Part A: Public Environmental Program	\$0.31 million
Part B: Water Supply	\$47.48 million	Part B: Water Supply	\$37.83 million

<b>Inputs (at Appraisal)</b>		<b>Inputs (Actual)</b>	
Systems Development		Systems Development	
Part C : Environmental Sanitation Improvements		Part C : Environmental Sanitation Improvements	
Drainage	\$4.69 million	Drainage	\$6.29 million
Sanitation Facilities	\$4.37 million	Sanitation Facilities	\$1.26 million
Part D: Implementation Assistance and Institutional Strengthening		Part D: Implementation Assistance and Institutional Strengthening	
Consulting Services	\$5.51 million	Consulting Services	\$6.75 million
Incremental Administration	\$0.32 million	Incremental Administration	\$1.11 million
Force Account Equipment	\$1.27 million	Force Account Equipment	\$2.51 million
Other Costs	\$2.86 million	Other Costs	\$1.57 million
Service Charge on Bank Loan	\$1.78 million	Service Charge on Bank Loan	\$1.65 million
<b>Government</b>	<b>\$19.68 million</b>	<b>Government</b>	<b>\$12.71 million</b>
Part B: Water Supply Systems Development	\$6.43 million	Part B: Water Supply Systems Development	\$9.62 million
Part C : Environmental Sanitation Improvements		Part C : Environmental Sanitation Improvements	
Drainage	\$0.91 million	Drainage	\$1.88 million
Sanitation Facilities	\$0.38 million	Sanitation Facilities	
Part D: Implementation Assistance and Institutional Strengthening		Part D: Implementation Assistance and Institutional Strengthening	
Consulting Services	\$0.22 million	Consulting Services	\$0.83 million
Incremental Administration	\$1.16 million	Incremental Administration	\$0.27 million
Force Account Equipment	\$0.02 million	Force Account Equipment	\$0.11 million
Other Costs		Other Costs	
Interest During Construction	\$10.55 million	Interest During Construction	
<b>Beneficiaries</b>	<b>\$3.32 million</b>	<b>Beneficiaries</b>	<b>Not available</b>
Part C : Environmental Sanitation Improvements		Part C : Environmental Sanitation Improvements	
Sanitation Facilities	\$3.32 million	Sanitation Facilities	Not available

CPMU = central project management unit, ICB = international competitive bidding, km = kilometer, LCB = local competitive bidding, lpcd = liters per capita per day, m = meter, m<sup>3</sup> = cubic meter, mm = millimeter, MOC = Ministry of Construction, NRW = nonrevenue water, O&M = operation and maintenance, PEEP = Public Environmental Education Program, PPC = provincial people's committee, PPIO = provincial project implementation office, UPWEC = urban public work and environmental company, VWU = Vietnam Women's Union, WSC = water supply company, WTP = water treatment plant.

**PROJECT COSTS AT APPRAISAL AND ACTUAL PROJECT COSTS**  
(\$ million)

Item	Appraisal Estimates			Actual		
	Foreign	Local	Total	Foreign	Local	Total
<b>A. Base Cost</b>						
1. Civil Works	25.84	22.78	48.63	11.21	10.64	21.85
2. Equipment and Materials	10.13	2.03	12.16	30.36	5.22	35.58
3. Consulting Services	2.86	2.16	5.03	6.69	0.97	7.66
4. Incremental Administration Institutional Development and	0.33	2.40	2.72	0.00	1.94	1.94
5. Strengthening	0.00	0.00	0.00	0.91	1.35	2.26
<b>Subtotal (A)</b>	<b>39.16</b>	<b>29.36</b>	<b>68.52</b>	<b>49.17</b>	<b>20.12</b>	<b>69.29</b>
<b>B. Contingencies</b>						
1. Physical	2.71	2.05	4.75	0.00	0.00	0.00
2. Price	3.48	2.67	6.15	0.00	0.00	0.00
<b>Subtotal (B)</b>	<b>6.19</b>	<b>4.72</b>	<b>10.91</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>C. Interest and Service Charge</b>						
1. Interest During Construction	0.00	10.55	10.55	0.00	0.00	0.00
2. Service Charge on Bank Loan	1.78	0.00	1.78	1.65	0.00	1.65
3. Taxes and Others	0.00	0.24	0.24	0.00	1.03	1.03
<b>Subtotal (C)</b>	<b>1.78</b>	<b>10.79</b>	<b>12.57</b>	<b>1.65</b>	<b>1.03</b>	<b>2.68</b>
<b>Total Project Cost</b>	<b>47.13</b>	<b>44.87</b>	<b>92.00</b>	<b>50.82</b>	<b>21.15</b>	<b>71.97</b>

Source(s): Project's RRP and CPMU

**BREAKDOWN OF YEARLY DISBURSEMENTS, 1997- 2006**  
(\$ million, except as indicated)

Year	Quarter	Capital Resources				Total Resources		Exchange Rate D/1\$	
		ADB Fund		Counterpart Fund		Amount	Cumulative		
		Amount	Cumulative	Amount	Cumulative				
									D million
1997	I	0.00	0.00		0.00	0.00	0.00		
	II	0.00	0.00		0.00	0.00	0.00		
	III	0.00	0.00		0.00	0.00	0.00		
	IV	0.50	0.50		0.00	0.00	0.50		
1998	I	0.80	1.30		0.00	0.00	0.80	1.30	
	II	0.21	1.52		0.00	0.00	0.21	1.52	
	III	0.76	2.28		0.00	0.00	0.76	2.23	
	IV	0.79	3.07	10.93	0.79	0.79	1.58	3.85	13,89
1999	I	0.39	3.46			0.79	0.39	4.25	
	II	0.49	3.94			0.79	0.49	4.73	
	III	0.67	4.62			0.79	0.67	5.41	
	IV	0.32	4.94	(0.20)	(0.01)	0.77	0.31	5.72	14,03
2000	I	0.36	5.31			0.77	0.36	6.71	
	II	0.46	5.77			0.77	0.46	6.54	
	III	2.34	8.11			0.77	2.33	8.88	
	IV	2.12	10.23	13.79	0.91	1.68	3.12	11.91	14,51
2001	I	2.00	12.26			1.68	2.03	13.94	
	II	1.88	14.13			1.68	1.87	15.81	
	III	5.42	19.56			1.68	5.42	21.23	
	IV	6.30	25.86	43.94	2.91	4.59	9.21	30.45	15,08
2002	I	1.04	26.89			4.59	1.04	31.48	
	II	1.07	27.96			4.59	1.07	32.55	
	III	1.72	29.68			4.59	1.72	34.27	
	IV	2.04	31.72	16.61	1.08	5.67	3.12	37.39	15,41
2003	I	1.80	33.52			5.67	1.80	39.19	
	II	0.71	34.23			5.67	0.71	39.90	
	III	0.96	35.18			5.67	0.96	40.85	
	IV	0.91	36.09	16.79	1.07	6.74	1.98	42.83	15,64
2004	I	2.84	38.94			6.74	2.84	45.68	
	II	0.95	39.89			6.74	0.95	46.63	
	III	2.22	42.11			6.74	2.22	48.85	
	IV	4.15	46.25	23.61	1.50	8.24	5.64	54.49	15,78
2005	I	2.46	48.71			8.24	2.46	56.95	
	II	3.97	52.68			8.24	3.97	60.92	
	III	4.65	57.33			8.24	4.65	65.57	
	IV	2.06	59.39	44.18	2.78	11.01	4.84	70.41	15,91
2006	I	(0.12)	59.27	27.07	1.69	12.71	1.57	71.90	16.00
Total			59.27			12.71		71.97	

( ) = negative.

Sources: ADB's Loan Financial System and CPMU.



**IMPLEMENTATION SCHEDULE, 1997–2005**  
**PACKAGE A TOWNS: NINH BINH, TUYEN QUANG, AND VINH**

COMPONENT	1997				1998				1999				2000				2001				2002				2003				2004				2005			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Part A: Public Environmental Education Program</b>																																				
Program Design																																				
Program Delivery																																				
<b>Part B: Water Supply Systems Development</b>																																				
Engagement of Consultants																																				
Land Acquisition																																				
Investigation (Geotechnical and Hydrogeological)																																				
Detailed Design																																				
Procurement of Equipment and Materials																																				
Construction: Ninh Binh, Tuyen Quang, and Vinh																																				
ICB Contractors																																				
Force Account																																				
<b>Part C: Environmental Sanitation Improvements</b>																																				
Sanitation Facilities Improvements																																				
Drainage Improvements																																				
<b>Part D: Implementation Assistance and Institutional Strengthening</b>																																				
Support to CPMU/PPIOs																																				
In-Country Training																																				
On-the-Job Training																																				

ICB: International Competitive Bidding.  
Source: CPMU.



As stated in the Memorandum of Understanding (April 1996, Appendix 10)



Actual Time Periods

**IMPLEMENTATION SCHEDULE, 1997–2005**  
**PACKAGE B TOWNS: BEN TRE, DONG HA, DONG HOI, AND QUY NHON**

COMPONENT	1997				1998				1999				2000				2001				2002				2003				2004				2005			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Part A: Public Environmental Education Program</b>																																				
Program Design																																				
Program Delivery																																				
<b>Part B: Water Supply Systems Development</b>																																				
Engagement of Consultants																																				
Land Acquisition																																				
Investigation (Geotechnical and Hydrogeological)																																				
Detailed Design																																				
Procurement of Equipment and Materials																																				
Construction: Ben Tre, Dong Ha, Dong Hoi, and Quy Nhon																																				
ICB Contractors																																				
Force Account																																				
<b>Part C: Environmental Sanitation Improvements</b>																																				
Sanitation Facilities Improvements																																				
Drainage Improvements																																				
<b>Part D: Implementation Assistance and Institutional Strengthening</b>																																				
Support to CPMU/PPIOs																																				
In-Country Training (Dates to be supplied by CPMU)																																				
On-the-Job Training (Dates to be supplied by CPMU)																																				

ICB: International Competitive Bidding

Source: ADB and CPMU



As stated in the Memorandum of Understanding (April 1996, Appendix 10)



Actual Time Periods

### STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Loan Agreement	Status of Compliance
<p><u>Project Execution and Coordination</u></p> <ol style="list-style-type: none"> <li>1. MOC, as the Executing Agency, shall be responsible for overall implementation of the project. Management Board for Water Supply and Sanitation Development Project shall appoint a suitably qualified project director and staff and resources are assigned exclusively to the project. The CPMU shall be involved in the operation, coordination and management of all project activities.</li> <li>2. Each WSC shall be the implementing agency for respective project towns. Separate provincial project implementation offices (PPIOs) shall be established, and are headed by suitably qualified and experience project managers.</li> <li>3. A Project Steering Committee (PSC) shall be established in Hanoi. The PSC shall be chaired by a Vice-Minister of MOC, and comprise representatives from MPI, MOF, State Bank of Viet Nam, the Ministry of Science, Technology and Environment and the VWU, and the Vice-Chairmen of the PPCs of the project towns. The PSC shall meet at least once every quarter and more frequently if needed.</li> </ol>	<p>Schedule 6, Paragraph 1</p> <p>Schedule 6, Paragraph 2</p> <p>Schedule 6, Paragraph 3</p>	<p>Complied with. A qualified project director and 11 staff were assigned at commencement of the Project in 1997.</p> <p>PPIOs were established in each of seven water supply companies (WSCs) with suitably qualified project managers and 10 staff, on average.</p> <p>The PSC was established on 11 August 1997 to provide guidance to the Project. The PSC met regularly every 6 months or as needed.</p>
<p><u>Land</u></p> <ol style="list-style-type: none"> <li>4. The Borrower shall ensure that all land, rights in land or rights-of-way, and other rights or privileges are promptly acquired or otherwise made available, and in any event within the time specified in the Land Acquisition Schedule agreed with the Bank.</li> </ol>	<p>Schedule 6, Paragraph 4</p>	<p>Partly complied with. Land acquisition and resettlement were required for Ben Tre, Dong Hoi, and Vinh. Delays in Ben Tre adversely affected project implementation. Site clearance for water treatment plants, as well as for transmission and distribution pipelines in the other towns were generally made in a timely manner.</p>

Covenant	Reference in Loan Agreement	Status of Compliance
<p><u>Operation and Maintenance (O&amp;M)</u></p> <p>5. The Borrower shall cause each WSC to take responsibility for the management and O&amp;M of their respective Project facilities after Project implementation.</p> <p>6. The Borrower shall ensure each WSC to draw up an operational program to reduce nonrevenue water to achieve a 30% target by December 2001. The individual program shall be reviewed by CPMU and forwarded to ADB for review by June 1997.</p> <p>7. The Borrower shall develop operational and financial guidelines and procedures to enable the WSCs to provide integrated water supply, drainage and sanitation services, and by 31 December 1997, shall ensure the operational integration of WSCs and Urban Public Works and Environmental Companies (UPWECs) through the development and implementation of appropriate operating and financial procedures for the integrated delivery of water and sanitation services.</p> <p>8. The Borrower shall ensure that each WSC upgrades the sanitation facilities of low-income households within its area to meet prescribed standards on the basis of full cost recovery. Each WSC shall require the householders to make a down payment of at least 50 % of the estimated cost of upgrading and to pay the remaining amount over the following 36 months. For this purpose, WSCs shall develop appropriate application and accounting procedures.</p>	<p>Schedule 6, Paragraph 5</p> <p>Schedule 6, Paragraph 6</p> <p>Schedule 6, Paragraph 7</p> <p>Schedule 6, Paragraph 8</p>	<p>Complied with. The WSCs have been authorized by the provincial governors (Instruction No. 59, dated October 1996) to use operating revenues to operate and maintain the treatment facilities, thereby helping to ensure the financial viability of the Project.</p> <p>Complied with. Nonrevenue water reduction programs were submitted to ADB. As of June 2006, Nonrevenue water is estimated to be less than 30% in all the project towns.</p> <p>Partly complied with. ADB was informed by the Executing Agency through its letter dated 22 December 2003 about difficulties in fully implementing this covenant during the project period due to an administrative reason. WSCs are for-profit enterprises with financial autonomy under the provincial governments, while the UPWECs operate without cost recovery under the municipal governments. Although some towns had started to make operational integration of the two functions, the process was slow.</p> <p>Complied with. A loan amounting to D1.5 million–D2.0 million was provided to each of the beneficiary households. As a result, about 15,000 households used the loans to upgrade their sanitation facilities. The loans were fully recovered from the beneficiaries.</p>





Covenant	Reference in Loan Agreement	Status of Compliance
15. The Borrower shall ensure that the CPMU shall have, in addition to other staff, two full-time staff members specifically assigned to coordinate the Public Environment Education Program, and that each PPIO shall have, in addition to other staff, two full time staff specifically assigned to the implementation of the Program. The two staff members of the CPMU shall be a UN Volunteer and Senior Public Environment Education Officer from the VWU.	Schedule 6, Paragraph 15	Complied with. All staff were assigned as envisaged.
16. The Borrower shall ensure that the beneficiaries are actively engaged in the planning, decision making, implementation and monitoring of the Project.	Schedule 6, Paragraph 16	Complied with. Beneficiaries actively participated in various project activities including group meetings, street campaigning, etc.
<u>Midterm Review</u>		
17. A comprehensive midterm review shall be carried out after about 2 years from the Effective Date. The review will critically evaluate the status of implementation, the delivery of the public environmental education program, the efficacy of the existing and implementing agencies, the implementation of institutional and policy reform, and the sustainability of benefits.	Schedule 6, Paragraph 17	Complied with. The midterm review was undertaken from 27 June to 13 July 2000.
<u>Institutional and Policy Reform</u>		
18. By 31 December 1997, the Borrower shall establish a department in MOC for coordinating water supply and sanitation sector development and for regulating tariff policies, technical standards, service levels, and human resources development.	Schedule 6, Paragraph 18	Complied with late. The department was established under MOC's decision dated 19 May 2003.
19. By 30 June 1997, the Borrower shall develop and adopt a National Water Supply and Sanitation Sector Policy, indicating sector institutional, physical and financial objectives, strategies to	Schedule 6, Paragraph 19	Complied with late. A National Orientation Plan for Water Supply to year 2010 was issued in 1998.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>achieve them, and the resources to be provided for doing so.</p> <p><u>The Institutional, Policy, Operational and Financial Action Plan</u></p> <p>20. The Borrower shall ensure that the Action Plan on institutional, policy, operational and financial objective to be achieved, as agreed with ADB is implemented in conjunction with the Project, and the actions specified therein shall be implemented as a component to the covenants included in this Schedule. The Action Plan shall be reviewed annually in consultation with ADB.</p>	Schedule 6, Paragraph 20	Partially complied with. The action plan on financial objectives, such as tariff adjustments and a debt-service ratio of 1.2:1 was not fully achieved in some of the towns.

BME = benefit monitoring and evaluation, CPMU = central project management unit, MOC = Ministry of Construction, MOF = Ministry of Finance, MPI = Ministry of Planning and Investment O&M = operation and maintenance, PPC = provincial people's committee, PPIO = provincial project implementation office, PSC = project steering committee, UPWEC = Urban Public Works and Environmental Company, VWU = Vietnam Women's Union, WSC = water supply company.



## ECONOMIC AND FINANCIAL REEVALUATION

### A. General

1. Economic analysis had been carried out for each of the Project's towns in the feasibility study reports. The methodology applied for the reevaluation was similar to that undertaken at appraisal and follows Asian Development Bank's (ADB's) guidelines for financial and economic analysis, as well as its framework for appraising urban development projects.<sup>1</sup> The reevaluation calculated the economic internal rate of return (EIRR) for each of the project components.

2. The financial analysis recalculated the financial internal rates of return (FIRR) to reassess the financial viability and sustainability of the operations of the seven water supply companies (WSCs) at project completion. This was done in accordance with the appropriate ADB guidelines.<sup>2</sup> The results of the recalculation were then compared with those estimated in the feasibility studies. The project cost, water tariff level, operating cost, revenue, and financing plan were revised, based on the financing reports of the WSCs that were provided during the Project Completion Review Mission. Financing viability was assessed for each WSC by comparing (i) the FIRR based on incremental revenue generation with the updated weighted average cost of capital for each component, and (ii) the average incremental financial revenue with the average incremental financial cost. Sensitivity testing was undertaken. The analysis was done in constant 2005 prices.

### B. Major Assumptions

3. The methodology and assumptions utilized for the economic evaluation of the project components generally followed those used in those components' feasibility studies. The economic benefits were quantified by comparing with- and without-project scenarios. Costs and benefits were measured at border price equivalent values, using domestic price numeraire, and were expressed in 2005 constant prices in Vietnamese dong. The project life of each component was assumed to be 25 years with no salvage value.. The Project Completion Review Mission's recalculation of EIRR also used economic opportunity cost of capital of 12% rather than the 10% used in feasibility studies.

4. The financial analysis applied only to the incremental investment made and to benefits achieved under the Project and not to the WSCs' entire operations. The major assumptions applied in the financial analysis are: (i) the analysis is conducted over a period of 20 years after project implementation, (ii) the incremental costs and revenue are expressed in Vietnamese dong in constant 2005 prices, and (iii) the operating lives of the investments range from 20 years to 40 years with no residual value.

5. The assessment of past financial performance was based on the financial statements provided by WSCs for 2004, 2005, and the first 6 months of 2006. Projected income statements, balance sheets, and cash flows were calculated to assess the future financial performance of the WSCs, and these data were used to consider the effects of depreciation, loan repayments,

<sup>1</sup> ADB. 2005. *Financial Management and Analysis of Projects*. Manila; ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila; ADB. 1994. *Framework for the Economic and Financial Appraisal of Urban Development Sector Projects*. Manila.

<sup>2</sup> ADB. 2002. *Guidelines for the Financial Governance and Management of Investment Projects Financed by ADB*. Manila.

and new tariffs. Major assumptions used in those projections include tariff increases in accordance with the proposed block tariffs for domestic customers and that loan proceeds are on-lent to the WSCs with an interest of 6.8% repayable over a period of 25 years that includes a 5 year grace period. The grace period was for both interest and principal payments. The annual payments were computed by the respective WSCs, using standard amortization. Based on the repayment schedule, most of the WSCs have prepared and proposed a schedule of tariff adjustments over the repayment periods to provincial people's committees for approval, and these are currently under consideration.

### C. Economic analysis

6. **Cost.** The costs of construction were derived from the actual costs incurred, excluding interest and other charges during construction. The economic costs were derived from their financial costs by excluding taxes and duties then converting the nontraded components to the domestic price numeraire. These costs were expressed in 2005 constant prices. The annual operation and maintenance (O&M) costs were based on information collected by the Project Completion Review Mission.

7. **Benefits.** The benefits associated with the economic analysis are resource cost savings from incremental water supply associated with the provision of reliable piped water. These benefits are (i) the significant reduction in nonrevenue water from 40% to less than 30%, (ii) the reduction in the cost of purchasing and treating water from alternative sources, and (iii) the resource cost savings from constructing and maintaining storage facilities and the time savings associated with water collection.

8. The estimates of reduction (or saving) values was used to estimate economic benefits. Reduction costs were computed in essentially the same way as used in the feasibility studies, with some changes in assumptions. The changes are: (i) resource costs savings were expressed in 2005 prices with the real inflation rate, and (ii) the deterioration of water system operation for all project towns without project was assumed to occur in 2015.

9. **Results of Economic Valuation.** The recalculated EIRRs in the seven project towns ranged from 13.29% to 22.93%, compared with those from 11.4% to 20.9% estimated in feasibility studies. The reason that the recalculated EIRRs are higher than those estimated at appraisal was mainly due to the reduced project costs and increased water consumption and sale in the project towns. The recalculated EIRRs compared with those estimated at appraisal are shown in Table A6.1.

**Table A6.1: Summary Economic Internal Rates of Return (EIRR), Project Towns**  
(%)

Project Town	At Appraisal	At Completion
Tuyen Quang	20.9	22.93
Ninh Binh	16.4	14.24
Vinh	16.1	18.35
Dong Hoi	11.4	13.38
Dong Ha	16.4	13.29
Qui Nhon	18.6	20.20
Ben Tre	11.0	14.88
<b>Average</b>	<b>N.A</b>	<b>16.79</b>

Source: Asian Development Bank estimates.

## D. Financial Analysis

10. **Project Costs.** Capital costs were revised based on actual project expenditures incurred from 1998 to 2005. The actual O&M costs from 2003 to 2005 were provided by each of the project towns. The O&M costs for the following years were projected and based on constant 2005 prices. The replacement costs assumed in the feasibility studies were used in the reevaluation, based on constant 2005 prices. All mechanical and electronic components were assumed to have lives of 20 years, whereas civil works were assumed to have lives of 40 years.

11. **Customer Distribution.** WSCs have four kinds of customers: domestic, commercial, industrial, and institutional. All of the customers use water taps and are connected directly to the water system. No standpipe exists in any of the project towns. Demolition of standpipes was effective in reducing the WSCs' nonrevenue water and financial losses. The majority of customers is domestic and account for 70% to 82% of water sold. The second-largest group is institutional customers, which consume 10% to 20% of water sold. Industrial customers account for the lowest share of water use. Shares by customer type are presented in Table A6.2

**Table A6.2: Customer Distribution**  
(%)

Customer	Tuyen Quang	Ninh Binh	Vinh	Dong Hoi	Dong Ha	Qui Nhon	Ben Tre
Domestic	76.7	73.7	70.8	74.5	81.5	73.3	69.1
Commercial	2.1	2.4	4.0	2.7	5.1	3.2	2.9
Industrial	0.0	8.4	6.3	6.1	3.1	11.4	6.8
Institutional	21.2	15.5	18.9	16.7	10.3	12.1	21.2

Sources: Water supply companies, 2005 figures.

12. **Water Tariff.** Block tariffs had not been imposed at the time of feasibility studies. During project implementation, block tariffs were introduced for domestic consumers in Tuyen Quang, Ninh Binh and Qui Nhon (Qui Nhon town had introduced the block tariff before 2002, but from 2002 up to now no block tariff has been used) but not in the remaining towns. Water tariffs had been adjusted sometimes, and most of the towns changed the tariffs during 2000–2001, during 2003–2004, and in 2005. The new water tariffs for 2005 that were used in the financial analysis are presented in Table A6.3.

**Table A6.3: Comparative Water Tariffs, 2005**  
(D/cubic meter)

Customer	Tuyen Quang	Ninh Binh	Vinh	Dong Hoi	Dong Ha	Qui Nhon	Ben Tre
Domestic			2,500	2,000	3,500	2,700	3,300
Block 1	1,700	2,214					
Block 2	2,000	2,838					
Block 3		3,406					
Block 4		3,974					
Industrial		4,768	4,000	6,000	5,700	4,200	3,800
Commercial	3,500	7,780	4,500	7,000	7,200	8,400	4,800
Institutional	2,150	3,406	3,500	5,400	4,800	3,500	3,300

Sources: Water supply companies, 2006 figures.

13. **Operation and Maintenance Costs.** According to WSCs' reports, O&M costs of water supply systems in 2005 were reduced by about 10% to 20% compared with those before the

Project was completed in all the WSCs. The main reason for this was the reduced costs for repairs and maintenance (such as for replacing machinery parts and damaged pipes). The unit cost of water production is lower than the average water tariffs currently charged in the WSCs, and this has a positive impact on the financial viability of the WSCs. O&M costs for each WSC are presented in Table A6.4.

**Table A6.4: Comparative Operation and Maintenance Costs, 2005**  
(D/cubic meter)

Cost	Tuyen Quang	Ninh Binh	Vinh	Dong Hoi	Dong Ha	Qui Nhon	Ben Tre
Power	184	284	399	320	213	347	264
Chemical	127	98	128	119	124	120	101
Repairs and Maintenance	32	67	177	171	166	135	70
Raw water fee	61	128	133	173	243	235	138
Salaries	457	467	522	405	446	457	386
Selling costs	152	156	174	135	182	186	129
Other	187	103	386	312	286	220	158
<b>Total<sup>a</sup></b>	<b>1,200</b>	<b>1,303</b>	<b>1,920</b>	<b>1,635</b>	<b>1,660</b>	<b>1,700</b>	<b>1,245</b>

<sup>a</sup>Some totals may not add due to rounding.

Sources: Water supply companies.

14. **Project Financial Analysis.** The results of recalculation show that the FIRR are higher than those estimated in feasibility studies by about 6% to 40% for five of the project towns (the exceptions being Tuyen Quang and Qui Nhon). The low level of water tariffs is the main reason for the low FIRRs in these two towns—and especially for Qui Nhon, which has the second-highest O&M costs. The reasons for higher FIRRs in the other towns are: (i) average water tariffs are higher than projected in the feasibility studies, (ii) the numbers of connected households are higher than projected, and (iii) the actual project costs were less than estimated. The sensitivity analysis indicates that the FIRR is more sensitive to decreases in revenues than to increases in O&M and project costs. The summary results of financial analysis are presented in Table A6.5.

**Table A6.5: Summary Results of Financial Analysis**

Item	Project Towns							Overall
	Tuyen Quang	Ninh Binh	Vinh	Dong Hoi	Dong Ha	Qui Nhon	Ben Tre	
Financial Internal Rate of Return (%)	5.10	6.89	10.82	6.79	6.90	5.21	8.36	7.68
Net Present Value (\$)	8.45	25.48	158.67	37.66	31.21	15.49	46.79	323.75
Case 1	4.21	6.41	9.89	5.83	6.00	4.33	7.14	6.72
Case 2	4.24	5.27	8.96	5.71	5.59	2.50	7.05	6.14
Case 3	4.36	5.25	7.84	5.23	5.07	2.13	5.40	5.29
Sensitivity Indicator: Case 1	7.99	0.98	0.88	3.01	2.67	7.15	2.27	2.13
Sensitivity Indicator: Case 2	7.86	3.78	2.86	4.05	4.64	21.72	3.12	4.32
Sensitivity Indicator: Case 3	13.50	10.45	4.65	5.80	6.45	24.48	6.91	6.65
Switching Value: Case 1	12.50	37.90	113.19	33.20	37.50	13.95	43.98	46.68
Switching Value: Case 2	12.70	26.20	34.93	24.70	21.55	4.60	32.10	23.09
Switching Value: Case 3	7.40	14.10	21.50	17.20	15.50	4.10	14.45	14.97

Source: Asian Development Bank estimates.

Case 1: Increase investment cost 10%

Case 2: Increase operating cost 10%

Case 3: Decrease of revenue 10%

Definitions of other items refer to ADB's Guideline for Financial and Economic Analysis

15. Tuyen Quang and Qui Nhon recorded FIRR of 5.1 and 5.21, respectively, which are lower than for the other towns. Ninh Binh, Dong Hoi and Dong Ha also recorded FIRR of from 6.8 to 8.4, which is not much higher than the interest rate of 6.8% for the subsidiary loan on-lent from the Ministry of Finance. The low FIRR are due to low levels of water tariffs and high O&M costs. Each WSC has a plan to adjust water tariffs from 2006 to 2010 by as much as 30% to 90% for all categories of customers in order to maintain adequate levels of debt service. All the WSCs are full aware that, if the water tariffs are kept at the current levels, the WSCs will not be able to repay the investment debts, especially since, starting from the end of 2006, most of the WSCs have become limited companies without subsidies from the provincial governments.

16. **Assessment of Financial Performance of WSCs.** The financial statements show that the performances of Dong Hoi, Dong Ha and Ben Tre WSCs were satisfactory. They had the highest ratios of net income to revenue recorded (ranging from 25% to 41.39%) before project completion, or operating cost ratios of less than 75%. Four other WSCs had low to very low ratios of net income to revenue recorded (from 15% to 24%) or operating cost ratios of over 75%. The lowest ratios of net income to revenue were recorded in Tuyen Quang and Vinh WSCs, with ratios of 15% and 19.8%, respectively, although their revenues to total assets were at the high levels of 41.87% and 92.63%, respectively. This indicates that, before project implementation, the operating costs of these WSCs were high because of old equipment, and that had pressed down upon their net incomes.

17. Before project implementation, all project WSCs had taken small loans. The extent of the debts was small also in their capital structures. During the project implementation period, self-financing ratios were low for all WSCs except Ninh Binh, Dong Hoi and Dong Ha, due to low amortization and low net income. A summary of WSCs' financial ratios for 3 years before project completion is presented in the Table A6.6.

**Table A6.6: Summary Financial Ratios, Three Year (2003–2005) Historical Averages**

Ratio	Project Towns						
	Tuyen Quang	Ninh Binh	Vinh	Dong Hoi	Dong Ha	Quy Nhon	Ben Tre
Current Ratio	1.01	2.70	0.50	0.95	0.32	0.68	0.83
Revenues to Total Assets (%)	41.87	31.37	92.63	15.31	43.98	42.02	23.27
Operating Cost Ratio (%)	84.67	77.99	80.19	58.61	75.03	75.59	68.12
Debt to Equity	0.49	1.80	0.50	0.30	0.20	0.40	0.50
Self-Financing (%)	17.51	36.61	6.50	40.35	62.37	7.84	3.15

Source: Asian Development estimates .

18. Since the project completion, all the WSCs have not yet taken the investments (assets) and debt obligations onto their financial statements. The main reasons are (i) the WSCs are yet to be made financially autonomous and without subsidy from provincial governments, (ii) project facilities have not yet been formally handed over to each of the WSCs, and (iii) they are incapable to assume debt repayment and amortization unless the new tariffs are introduced. The adjustment of water tariffs during project implementation was only to provide for the WSCs' ordinary operations without regard to repayment of the project loan debt. With the current tariffs, the companies could not repay the debt, because higher amortization would reduce their net incomes and lead to very low debt service coverage ratios not exceeding 0.5:1. To solve the problem of increasing operation costs in future, the WSCs have proposed plans to increase water tariffs to meet their financial requirements. The proposed new tariffs are higher than those currently by 30% to more than 90%. For instance, Tuyen Quang WSC proposes an average

tariff of 2,581 D/m<sup>3</sup> (an increase of 32% over the current tariff level). Other proposed new tariffs (and increases): Dong Ha, 4,300 D/m<sup>3</sup> (40% increase); Dong Hoi, 5,745 D/m<sup>3</sup> (90% increase); Ninh Binh, 5,585 D/m<sup>3</sup> (97% increase). With the new tariffs to be introduced, Ben Tre, Ninh Binh, and Qui Nhon WSCs will be able to allocate net income to the repayment of debts. Although the other WSCs will raise water tariffs, the increases do not meet the requirement for repayment of debts. A summary of the projected financial ratios with the proposed tariffs is presented in Table A6.7.

**Table A6.7: Summary of Financial Ratios, Five Years (2006–2010) Projected Average**

Ratio	Project Towns						
	Tuyen Quang	Ninh Binh	Vinh	Dong Hoi	Dong Ha	Quy Nhon	Ben Tre
Current Ratio	4.10	3.60	7.20	1.20	3.40	3.30	2.80
Revenues to Total Assets (%)	21.35	26.81	13.64	59.47	22.06	28.06	27.59
Operating Cost Ratio (%)	51.70	24.56	52.77	37.32	62.16	33.33	30.84
Debt to Equity	6.60	1.24	0.80	0.80	2.23	2.57	2.10
Debt Service Coverage	0.82	3.46	1.15	1.03	0.86	1.50	1.38
Self-Financing (%)	9.72	37.79	49.25	64.52	8.55	23.56	18.82

Source: Asian Development estimates.

19. The introduction of new tariffs will lead to higher net income ratios and improved financial performance of the WSCs. Although Tuyen Quang, Vinh, Dong Hoi, and Dong Ha WSCs have proposed new tariffs to generate funds for debt repayment, the proposed tariff levels are still insufficient to ensure repayment. These WSCs need to raise water tariffs to levels that will at least recover all O&M costs and depreciation, debt service, a reasonable proportion of future capital expenditures, plus taxes and dividends. To meet these requirements, Tuyen Quang needs to boost tariffs by 50%, Vinh by 55%, Dong Hoi by 120%, and Dong Ha by 55%, instead of the 32%, 50%, 90%, and 40%, respectively, as proposed by each of those WSCs. If the tariffs remain at their present levels, the financial sustainability of these WSCs will be weak, as they will not have sufficient funds to repay their debts. If this happens, the Government will have no option but to continue supporting these WSCs for the next several years.

## SUMMARY OF RESETTLEMENT AND LAND COMPENSATION

Table A7.1: Numbers of Affected Households

Town	Affected Household			Total
	Resettled at Site	Relocated Elsewhere	Marginally Affected	
Tuyen Quang	0	0	0	0
Ninh Binh	0	0	0	0
Vinh <sup>a</sup>	0	1	0	1
Dong Hoi	0	7	0	7
Dong Ha	0	0	0	0
Qui Nhon	0	0	0	0
Ben Tre <sup>a</sup>	0	6	0	6
<b>Total</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>14</b>

<sup>a</sup> Only Vinh and Ben Tre towns had resettlement impacts.

Sources: Resettlement plans for Vinh, Dong Hoi, and Ben Tre; provincial project implementation offices.

Table A7.2: Compensation of Estimated and Actual Compensation Expenditure (D'000)

Town	Original Estimate			Actual Expenditure		
	Land	Compensation	Total	Land	Compensation	Total
Tuyen Quang	0	0	0	0	0	0
Ninh Binh	0	0	0	0	0	0
Vinh	1,785,228	2,383,718	4,168,946	1,785,228	2,383,718	4,168,946
Dong Hoi	101,553	260,793	366,537	101,553	260,793	366,537
Dong Ha	337,000	3,771,000	4,108,000	337,000	3,771,000	4,108,000
Qui Nhon	1,200,000	2,300,000	3,500,000	1,200,000	2,300,000	3,500,000
Ben Tre	726,132	0	726,132	726,132	0	726,132
<b>Total</b>	<b>4,149,913</b>	<b>8,715,511</b>	<b>12,865,424</b>	<b>4,149,913</b>	<b>8,715,511</b>	<b>12,865,424</b>

Sources: Project resettlement and compensation reports from all provincial project implementation offices.

Table A7.3: Resettlement Implementation

Town	Affected Household			
	Consulted	Disclosed	Resolved	Paid
Tuyen Quang	Yes	Yes	Yes	Yes
Ninh Binh	Yes	Yes	Yes	Yes
Vinh	Yes	Yes	Yes	Yes
Dong Hoi	Yes	Yes	Yes	Yes
Dong Ha	Yes	Yes	Yes	Yes
Qui Nhon	Yes	Yes	Yes	Yes
Ben Tre	Yes	Yes	Yes	Yes

Sources: Project resettlement and compensation reports from all provincial project implementation offices.

**Table A7.4: Land Compensation**

<b>Town</b>	<b>Land Area (m<sup>2</sup>)</b>	<b>Building Area (m<sup>2</sup>)</b>	<b>Land Value (D/m<sup>2</sup>)</b>
Tuyen Quang	0		
Ninh Binh	0		
Vinh	3,700	1,320	2,200
Dong Hoi	17,073	0	4,016
Dong Ha	35,000	0	9,628
Qui Nhon	50,000	0	24,000
Ben Tre	12,279	252	59,136

m<sup>2</sup> = square meter.

Sources: Project resettlement and compensation reports from all provincial project implementation offices.



## QUANTITATIVE ASSESSMENT OF OVERALL PROJECT PERFORMANCE

**Table A8.1: Overall Rating**

Criteria	Assessment	Rating	Weight (%)	Weighted Rating
Relevance	Highly Relevant	3	20	0.60
Effectiveness	Effective	2	30	0.60
Efficiency	Less Efficient	1	30	0.30
Sustainability	Likely	2	20	0.40
Overall Rating	Successful			1.90

Relevance	Project's impact and outputs were fully consistent with the government's development strategy, the ADB's lending strategy for the country, and the ADB's strategic objectives at the time of approval and evaluation and the adequacy design.
Effectiveness	Project achieved its outcomes and likely to attain its targeted impact.
Efficiency	Project achieved its objectives in a relatively efficient manner.
Sustainability	Project's outcomes and development impacts are sustainable by sound operation and management of project facilities.

Source(s): "ADB Guidelines for Preparing Performance Evaluation Report for Public Sector, January 2006. Appendix 3 Examples of Rating Each Criterion and Overall Performance Assessment"

**Table A8.2: Rating System**

Rating Value	Relevance	Effectiveness	Efficiency	Sustainability
3	Highly Relevant	Highly Effective	Highly Efficient	Most Likely
2	Relevant	Effective	Efficient	
1	Partly Relevant	Less Effective	Less Efficient	Likely
	Irrelevant	Ineffective	Inefficient	Less Likely
0				Unlikely

Rating: >2.7	=	Highly Successful
1.6-2.7	=	Successful
0.8-1.6	=	Partly Successful
<0.8	=	Unsuccessful

Source(s): "ADB Guidelines for Preparing Performance Evaluation Report for Public Sector, January 2006. Appendix 3 Examples of Rating Each Criterion and Overall Performance Assessment"