



# Completion Report

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Project Number: 27250  
Loan Number: 1472  
August 2006

## Philippines: Small Towns Water Supply Sector Project

## CURRENCY EQUIVALENTS

Currency Unit – Philippine peso (₱)

		<b>At Appraisal</b>	<b>At Project Completion</b>
		31 August 1996	30 June 2004
₱1.00	=	\$0.0382	\$0.0188
\$1.00	=	₱26.20	₱57.00

## ABBREVIATIONS

ADB	–	Asian Development Bank
BME	–	benefit monitoring and evaluation
DOH	–	Department Of Health
EA	–	executing agency
FIU	–	Field Implementation Unit (LWUA)
IATC	–	Inter-Agency Technical Committee
ICB	–	international competitive bidding
IDC	–	interest during construction
LWUA	–	Local Water Utilities Administration
MIS	–	management information system
MISD	–	management information system division
MTDP	–	medium term development plan
NEDA	–	National Economic and Development Authority
NGO	–	nongovernment organization
NRW	–	nonrevenue water
O&M	–	operation and maintenance
PCR	–	project completion report
PMO	–	project management office
PPMS	–	project performance monitoring system
RE	–	resident engineer
RRP	–	report and recommendation of the President
SLA	–	subsidiary loan agreement
STWSSP	–	Small Towns Water Supply Sector Project

## WEIGHTS AND MEASURES

m <sup>3</sup>	–	cubic meter
m <sup>3</sup> /d	–	cubic meters per day

## NOTES

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

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## BASIC DATA

### A. Loan Identification

1.	Country	Philippines
2.	Loan Number	1472
3.	Project Title	Small Towns Water Supply Sector Project
4.	Borrower	Local Water Utilities Administration (LWUA)
5.	Executing Agency	LWUA
6.	Amount of Loan	\$50.0 million
7.	Project Completion Report Number	PCR:PHI 944

### B. Loan Data

1.	Appraisal	
	– Date Started	7 March 1996
	– Date Completed	17 April 1996
2.	Loan Negotiations	
	– Date Started	29 August 1996
	– Date Completed	29 August 1996
3.	Date of Board Approval	30 September 1996
4.	Date of Loan Agreement	3 June 1997
5.	Date of Loan Effectiveness	
	– In Loan Agreement	3 September 1997
	– Actual	7 October 1997
	– Number of Extensions	0
6.	Closing Date	
	– In Loan Agreement	30 June 2002
	– Actual	14 December 2004
	– Number of Extensions	1
7.	Terms of Loan	
	– Interest Rate	Variable <sup>1</sup>
	– Maturity	25 years
	– Grace Period	5 years
8.	Terms of Relending	
	– Interest Rate	Variable <sup>2</sup>
	– Maturity	15–25 years
	– Grace Period	4 years
	– Second-Step Borrower	Water districts

<sup>1</sup> In accordance with Section 3.2 of the Pool-Based Loan Regulation, later changed to “in accordance with LIBOR-based Loan Regulations, Section 3.02.”

<sup>2</sup> LWUA imposes a graduated interest rate structure based on the total debt water districts have secured from LWUA. The interest rates are as follows: (i) 8.5% on the first P2.0 million, (ii) 10.5% on the portion of debt between P2.0 million and P7.0 million, (iii) 12.5% on the portion of debt between P7.0 million and P20.0 million, (iv) 14.5% on the portion of debt between P20.0 million and P50.0 million, and (v) 15% on the portion of debt in excess of P50.0 million.

9. Loan Cancellations:
- 27 June 2002, \$5.0 million
  - 22 March 2004, \$12.0 million
  - 14 December 2004, \$8.2 million

10. Disbursements

a. Dates

<b>Initial Disbursement</b>	<b>Final Disbursement</b>	<b>Time Interval</b>
1 March 1998	14 December 2004	81 months
<b>Effective Date</b>	<b>Closing Date</b>	<b>Time Interval</b>
7 October 1997	Original: 30 June 2002 Actual: 14 December 2004	57 months 86 months

b. Amount (\$ million)

<b>Category</b>	<b>Original Allocation</b>	<b>Last Revised Allocation</b>	<b>Amount Canceled</b>	<b>Net Amount Available</b>	<b>Amount Disbursed</b>	<b>Undisbursed Balance</b>
Civil Works (Part A)	26.90	11.57	15.33	11.57	11.57	0.0
Equipment & Materials (Part A)	10.40	5.77	4.63	5.77	5.77	0.0
Water Quality Test (Part B)	1.00	0.00	1.00	0.00	0.00	0.0
Capacity Bldg Program (Part C)	0.10	0.00	0.10	0.00	0.00	0.0
Consulting Services (Part C)	4.90	4.30	0.60	4.30	4.30	0.0
Interest During Construction	6.70	3.16	3.54	3.16	3.16	0.0
<b>Total</b>	<b>50.00</b>	<b>24.80</b>	<b>25.20</b>	<b>24.80</b>	<b>24.80</b>	<b>0.0</b>

11. Local Costs (Financed)
- Amount (\$ million) 6.93
  - Percent of Local Costs 46.54
  - Percent of Total Cost 27.98

**C. Project Data**

1. Project Cost (\$ million)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Foreign Exchange Cost	35.11	17.87
Local Currency Cost	47.89	32.20
<b>Total</b>	<b>83.00</b>	<b>50.07</b>

## 2. Financing Plan (\$ million)

Source	Appraisal Estimate			Actual		
	Foreign Currency	Local Currency	Total	Foreign Currency	Local Currency	Total
<b>A. Implementation Costs</b>						
Borrower Financed						
LWUA	0.00	24.70	24.70	0.00	18.15	18.15
Water Districts	0.00	8.30	8.30	0.00	7.12	7.12
Subtotal	0.00	33.00	33.00	0.00	25.27	25.27
ADB-Financed	35.11	14.89	50.00	17.87	6.93	24.80
<b>Total</b>	<b>35.11</b>	<b>47.89</b>	<b>83.00</b>	<b>17.87</b>	<b>32.20</b>	<b>50.07</b>
<b>B. IDC Costs</b>						
Borrower-Financed	0.00	6.90	6.90	0.00	0.00	0.00
ADB-Financed	6.70	0.00	6.70	3.16	0.00	3.16
<b>Total</b>	<b>6.70</b>	<b>6.90</b>	<b>13.60</b>	<b>3.16</b>	<b>0.00</b>	<b>3.16</b>

ADB = Asian Development Bank, IDC = interest during construction, LWUA = Local Water Utilities Administration.

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

Component	Appraisal Estimate <sup>a</sup>			Actual		
	Foreign Currency	Local Currency <sup>b</sup>	Total	Foreign Currency	Local Currency <sup>c</sup>	Total
<b>A. Water Supply Facilities</b>						
1. Land	0.00	1.17	1.17	0.00	0.00	0.00
2. Civil Works	15.52	31.94	47.46	6.70	29.39	36.09
3. Equipment & Materials	10.21	1.41	11.62	5.64	0.77	6.41
4. Administration Support	0.00	1.54	1.54	0.00	0.00	0.00
<b>Subtotal (A)</b>	<b>25.73</b>	<b>36.06</b>	<b>61.79</b>	<b>12.34</b>	<b>30.16</b>	<b>42.50</b>
<b>B. Health Education and Water Quality Testing</b>						
1. Health and Hygiene Education	0.00	0.08	0.08	0.00	0.00	0.00
2. Water Quality Testing	1.04	0.48	1.52	0.00	0.00	0.00
<b>Subtotal (B)</b>	<b>1.04</b>	<b>0.56</b>	<b>1.60</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>C. Institutional Development</b>						
1. Capacity Building Program	0.06	0.99	1.05	0.00	0.00	0.00
2. Benefit Monitoring and Evaluation	0.00	0.07	0.07	0.00	0.00	0.00
3. Consulting Services	1.60	3.25	4.85	2.37	2.04	4.41
<b>Subtotal (C)</b>	<b>1.66</b>	<b>4.31</b>	<b>5.97</b>	<b>2.37</b>	<b>2.04</b>	<b>4.41</b>
Interest During Construction	6.68	6.96	13.64	3.16	0.00	3.16
<b>Total</b>	<b>35.11</b>	<b>47.89</b>	<b>83.00</b>	<b>17.87</b>	<b>32.20</b>	<b>50.07</b>

<sup>a</sup> August 1996 price level and all amounts include price and physical contingencies.

<sup>b</sup> Local currency cost includes duties and taxes estimated at \$6.4 million.

<sup>c</sup> Actual local currency cost includes \$5.53 million disbursed by the LWUA after project completion date.

## 4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultant:		
Project Implementation Support	End of 1996	9 March 1998
Completion of Engineering Designs	June 2001	June 2003
Civil Works Contracts:		
- Date of Award	Oct 1997–Oct 1999	June 2000–Oct 2003
- Completion of Work	December 2001	May 2005
Equipment and Materials:		
- First Procurement	March 1997	June 2001
- Last Procurement	June 2000	October 2003
- Completion of Equipment Installation	October 2000	May 2005
Start of Operations:		
- Completion of Tests and Commissioning	December 2001	June 2005
- Beginning of Start-Up	June 2002	June 2005

## 5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 30 November 1998 to 31 August 1999	Satisfactory	Satisfactory
From 31 October 1999 to 31 March 2000	Satisfactory	Partly Satisfactory
From 30 April 2000 to 31 May 2001	Satisfactory	Satisfactory
From 30 June 2001 to 31 August 2001	Satisfactory	Partly Satisfactory
From 30 September 2001 to 31 January 2003	Satisfactory	Satisfactory
From 28 February 2003 to 30 March 2003	Satisfactory	Unsatisfactory
From 31 March 2003 to 31 July 2004	Satisfactory	Satisfactory

## D. Data on Asian Development Bank Missions

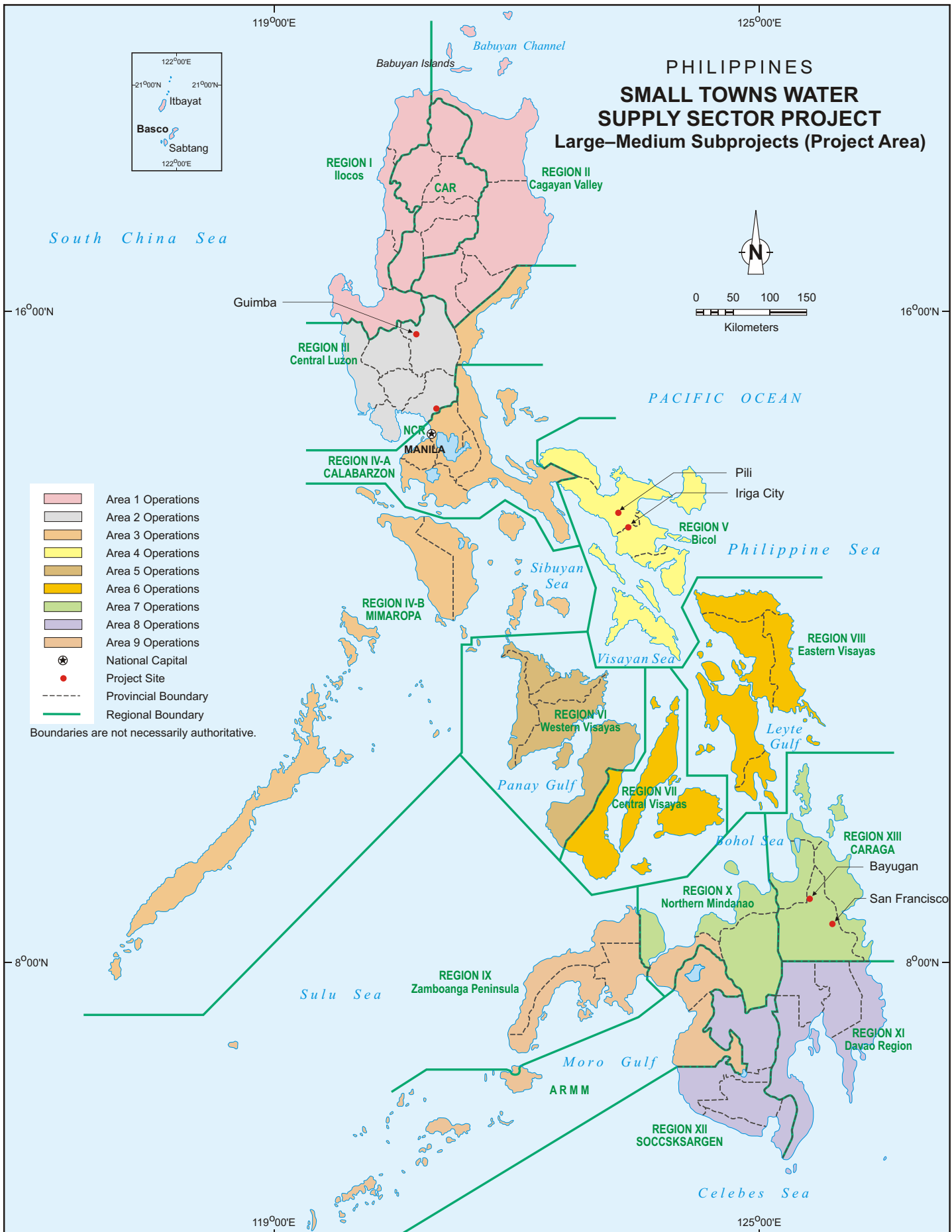
Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members <sup>a</sup>
Fact-Finding	20 November–8 December 1995	3	17	a, e, f, g, k
Appraisal	7 March–17 April 1996	5	25	a, b, e, g, l
Inception	20–24 October 1997	2	15	e, i
Review	23 November 1998–18 December 1998	2	19	e, j
Review	7 June–21 July 1999	2	10	e, j
Review	24 February–10 March 2000	3	42	h, j
Midterm	22 June–12 December 2001 (intermittent)	4	40	c, d, j, k
Review	25 February–13 March 2002 (intermittent)	2	8	e, j
Review	31 March–15 April 2003	2	10	e, j
Review	21 April–09 May 2003	2	15	c, e
Special Loan Administration	24 June–15 July 2004	2	22	e, j
<b>Subtotal during project implementation</b>		<b>29</b>	<b>223</b>	
Project Completion Review				

<sup>a</sup> a = senior programs officer, b = senior project engineer, c = senior financial management specialist, d = senior project economist, e = project economist, f = project engineer, g = counsel, h = urban development specialist, i = senior assistant, j = assistant project analyst, k = financial analyst/staff consultant, l = institutional development expert/ staff consultant.



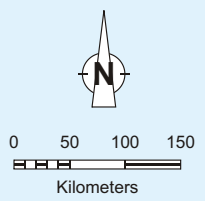


# PHILIPPINES SMALL TOWNS WATER SUPPLY SECTOR PROJECT Large-Medium Subprojects (Project Area)



- Area 1 Operations
- Area 2 Operations
- Area 3 Operations
- Area 4 Operations
- Area 5 Operations
- Area 6 Operations
- Area 7 Operations
- Area 8 Operations
- Area 9 Operations
- ⊕ National Capital
- Project Site
- Provincial Boundary
- Regional Boundary

Boundaries are not necessarily authoritative.



## I. PROJECT DESCRIPTION

1. At the time of appraisal, the urban water supply in the Philippines was inadequate. Only about 70% of the urban population had access to safe water. In smaller towns, the coverage was much lower than the national urban average and increasing access to potable water facilities in small towns was a national priority. There was also a need to build the capacity of water districts to enable them to implement water supply subprojects and undertake operation and maintenance (O&M) of the systems. In September 1996, the Asian Development Bank (ADB) approved the Small Towns Water Supply Sector Project (STWSSP).<sup>1</sup> The Project was designed to enhance urban water supply coverage and contribute to improving urban living and health conditions, as well as the institutional capabilities of the water districts. It was in line with the Government's objectives and used a community management approach. The Local Water Utilities Administration (LWUA) was the Executing Agency (EA) and managed and coordinated project activities. The original project framework is contained in Appendix 1.

2. The primary objectives of STWSSP were to (i) provide safe, adequate, and reliable piped water supply services to selected small urban communities; (ii) improve health and hygiene education, and water quality testing to ensure the sustainability of project benefits; and (iii) improve the capacity of water districts through training in the planning, implementation, and O&M of water supply services. The Project was targeted to cover about 80 small towns throughout the country with populations ranging from 10,000 to 100,000.<sup>2</sup> It involved the improvement of water supply facilities and institutional development in the small towns through the construction and rehabilitation of piped water supply. The goal was to increase the total population served by piped water supply in the 80 water districts from 0.3 million to 1.0 million by 2001, and to increase the number of service connections from about 60,000 to 200,000. Nonrevenue water (NRW), which averaged about 35% during appraisal, was expected to be reduced to about 25% through the rehabilitation of the existing systems. Production capacity was expected to be increased to about 160,000 cubic meters per day (m<sup>3</sup>/day).

3. The Project had three components: part A, which included the development and expansion of piped water supply systems in about 80 towns;<sup>3</sup> part B, which included health education and water quality testing programs;<sup>4</sup> and part C, which covered a capacity building program for water district staff, a benefit monitoring and evaluation (BME) program, and consulting services to support the EA.

## II. EVALUATION OF DESIGN AND IMPLEMENTATION

### A. Relevance of Design and Formulation

4. ADB's operational strategy as formulated in the country assistance plan<sup>5</sup> for the Philippines supported the Government's Medium Term Development Plan (MTDP) 1993–1998. Its main emphasis was on human development by providing financial and technical support for infrastructure and social sector development. ADB's strategy for urban water supply was to

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<sup>1</sup> ADB. 1996. *Report and Recommendation of the President to the Board of Directors for a Proposed Loan to the Local Water Utilities Administration in the Republic of the Philippines for the Small Towns Water Supply Sector Project*. Manila.

<sup>2</sup> Countrywide there are about 300 towns in this population range.

<sup>3</sup> The initial list of possible subprojects involved about 20 subprojects requiring the construction of new systems, while the remaining 60 involved the expansion and improvement of existing systems.

<sup>4</sup> The health and hygiene education program was to have been provided by LWUA in coordination with the Department of Health (DOH). The objective was to improve understanding by project beneficiaries of the close relationship between hygiene, water, sanitation, and health, with a particular focus on safe drinking water, personal hygiene, and adequate waste water disposal.

<sup>5</sup> ADB. 1996. *Country Assistance Plan*. Manila.

increase overall population coverage and to strengthen the water districts. The Government's MTDP for 2004–2010 presents several medium-term goals and strategies for the water supply and sanitation (WSS) sector in the Philippines, including (i) provision of potable water to the entire country by 2010, through private or public investment; and (ii) continued provision of capacity building programs and technical assistance (TA) on WSS planning, management and project implementation for all water service providers needing assistance. The Project reflected the priorities of both ADB and the MTDP.

5. The Project was formulated through a sound demand-based process and numerous consultations with representatives of the Government, local government units (LGUs), communities, and funding agencies. Initial financial evaluations and socioeconomic analysis of 30 out of the original 100 subprojects were carried out. Detailed financial and economic analyses were made for 6 subprojects. As a result the number of subprojects was reduced to 60 small subprojects, 15 medium-sized subprojects, and 5 large subprojects. This categorization was based on the investment cost of each subproject.<sup>6</sup>

6. During project implementation, the number of subprojects was adjusted. The general trend was to reduce the number of large and medium-sized subprojects and to increase the number of small subprojects.

7. Based on the lessons learned from previous ADB-financed water supply projects, the following approaches were included in the Project design: (i) local communities and water districts had to be involved in subproject conceptualization and implementation to ensure ownership and readiness for O&M, (ii) the financial viability of water districts had to be sustained, (iii) efficiency of water tariff revenue collection had to be improved, (iv) comprehensive water quality testing had to be carried out, and (v) institutional development of water districts had to be pursued.

## **B. Project Outputs**

### **1. Part A: Construction/Rehabilitation of Water Supply Facilities**

8. As of 30 June 2004, the date of loan closure, there were 103 subprojects with signed subsidiary loan agreements (SLA) with the LWUA. Of these, 37 (36%) had been completed and the remaining 66 were under construction. As of 31 March 2006, 90 subprojects (87%) had been completed, while 13 were still under construction.

9. These figures are higher than the target of 80 subprojects. However, although the original target included 20 large or medium-sized subprojects, only five<sup>7</sup> were constructed. The cancellation of the Bulacan bulk water supply scheme<sup>8</sup> resulted in the withdrawal of eight large or medium-sized subprojects<sup>9</sup> The reasons for the shortfall in large or medium-sized subprojects

<sup>6</sup> A small project costs less than \$0.8 million; a medium-sized project more than \$0.8 million but less than \$2 million; a large project more than \$2.0 million.

<sup>7</sup> Large and medium-sized subprojects consisted of Bayugan, Guimba, Iriga, Pili, and San Francisco.

<sup>8</sup> In November 2000, eight water districts (Balagtas, Bocaue, Bulacan, Guiguinto, Malolos, Marilao, Meycauayan, and Obando) entered into a tripartite agreement with LWUA and the Bulacan Water Consortium for the Bulacan Water Consortium to supply bulk water to the eight water districts under a build-operate-transfer scheme. The eight water districts intended to use networks that would be expanded under the STWSSP. The feasibility study carried out under the STWSSP concluded that there was a very little potential for groundwater exploitation in the Bulacan area, so there was a recommendation to tap Bulacan bulk water supply system as the source for year 2005 onwards. However, Vivendi Water, the holding company of the Bulacan Water Consortium decided to withdraw from the project in February 2003. Following Vivendi's withdrawal, the water districts (except for Obando) also decided to withdraw from STWSSP because of the lack of a source alternative.

<sup>9</sup> These subprojects had revised feasibility studies (FS) and completed detailed design, and in some cases were ready for tendering of construction.

include: (i) the requirement to put such projects out to public tender, while smaller subprojects could be implemented by the water districts using their own equipment and human resources; and (ii) the LWUA's onlending system, which involved a progressive increase in the interest rate<sup>10</sup> and was a disincentive for water districts to take out larger loans. Of the 20 large or medium-sized subprojects that were identified and approved by the Inter-Agency Technical Committee (IATC), only five were constructed.

10. Out of a total of 199 identified small subprojects, 123 were approved by the IATC and only 98 were or are being constructed. The others were deferred mainly because of: (i) nonacceptance of the subproject by the water district board, (ii) management problems within the water district, (iii) nonfeasibility or nonviability of projects, (iv) nonacceptance of increased water tariffs, and (v) water district not able to secure necessary endorsements from the municipal development council (MDC) and/or regional development council (RDC).

11. Detailed information on the water supply facilities that were constructed is presented in Appendix 2. Tables 1 and 2 compare the implementation progress of the subprojects with the targets in the report and recommendation of the President (RRP).

**Table 1: Summary of the Status of Subproject Implementation**

Item	Large/Medium	Small	Total
<b>Projected</b>	20	60	80
<b>Actual as of Project Completion Date <sup>a</sup></b>			
Identified	20	199	219
IATC Approved	20	123	143
SLA Signed	5	98	103
Ongoing Construction	2	64	66
Completed	3	34	37
<b>Actual as of PCR <sup>b</sup></b>			
Identified	20	199	219
IATC Approved	20	123	143
FS/POW Completed	20	112	132
SLA Signed	5	98	103
Ongoing Construction	0	13	13
Completed	5	85	90

FS = feasibility study, IATC = Inter-Agency Technical Committee, PCR = project completion review, POW = program of work, RRP = report and recommendation of the President, SLA = subsidiary loan agreement (between the Local Water Utilities Administration [LWUA] and water district).

<sup>a</sup> As of 30 June 2004.

<sup>b</sup> As of 31 March 2006.

Source: Local Water Utilities Administration.

**Table 2: Summary Data on Served Population**

Item	Data per June 2004	Data per December 2005	Increase
<b>Projects completed by June 2004</b>			
Number of projects	37	37	
Total population served	561,141	637,216	
Average population served	14,767	16,769	14%
<b>Projects completed by December 2005</b>			
Number of projects		51	
Total population served		1,073,940	
Average population served		21,058	

<sup>10</sup> The LWUA imposes a graduated interest rate structure based on the total debt water districts have secured from the LWUA. The interest rates are as follows: (i) 8.5% on the first P2.0 million, (ii) 10.5% on the portion of debt between P2.0 million and P7.0 million, (iii) 12.5% on the portion of debt between P7.0 million and P20.0 million, (iv) 14.5% on the portion of debt between P20.0 million and P50.0 million, and (v) 15% on the portion of debt in excess of P50.0 million.

Item	Data per June 2004	Data per December 2005	Increase
<b>Projects ongoing by December 2005</b>			
Number of projects		13	
Expected total population to be served		439,223	
Expected average population to be served		33,786	

Source: Local Water Utilities Administration.

12. The project target was to serve an additional 700,000 people (60% them below the poverty line) with piped water. At loan closing date, the 38 completed subprojects served an additional 560,000 persons. By the end of 2005, these 38 projects had extended their coverage to 635,000 persons, while the others that had been completed served an additional 1,075,000 people. The total population served by December 2005 was about 1,710,000 and an additional 440,000 people were expected to be served by the subprojects still under construction. No data are available on the number of these people who lived below the poverty line. No distinction was made between people benefiting directly from the Project through a new house connection, and the population benefiting indirectly through a higher level of service, e.g., higher pressure, more stable supply, or better water quality.

## 2. Part B: Health Education and Water Quality Testing

13. During project implementation, the LWUA determined that a similar project funded by the Japan International Cooperation Agency (JICA)<sup>11</sup> had the same objectives regarding water quality testing and that a United Nations International Children's Fund (UNICEF) project<sup>12</sup> had developed training materials for health and hygiene education. On the advice of ADB<sup>13</sup> this project component was therefore cancelled. Data on the outcome of the JICA and UNICEF projects specifically for the water districts covered under STWSSP are not readily available.

## 3. Part C: Institutional Development

### a. Capacity Building Program

14. As provided for in the RRP, the program included training in: (i) reduction of NRW; (ii) management organization; (iii) planning, engineering and financial management; and (iv) computerization of administrative, accounting, billing and collection, engineering, and financial operations. However, since the LWUA had carried out similar training through its Water Resource Research and Training Center (WRRTC), it was agreed that this training would be undertaken by the LWUA as part of its regular training program. This part of the loan amount remained unutilized and was eventually cancelled. During the midterm review, the quality of the training was assessed and found to be adequate, of high quality, and useful (footnote 11). Of the staff employed by the water districts where the subprojects were implemented, 1,347 members were trained during the project implementation period (89% of the target).

<sup>11</sup> In August 1999, JICA provided a grant package which includes: (i) a 5-year local training program aimed at training 3,000 participants in countering NRW, water quality management and improvement, and water supply management; (ii) an equipment supply program that would provide P1.79 million worth of laboratory equipment; and (iii) dispatching a team of JICA experts on water quality improvement to establish water treatment system design criteria and water quality monitoring with underground water quality database.

<sup>12</sup> UNICEF. 1999. *Training Materials for Health and Hygiene Education for Department of Health*. Washington D.C.

<sup>13</sup> ADB. 2001. Back-to-Office Report of the Midterm Loan Review Mission. Loan No. 1472-PH: Small Towns Water Supply Sector Project. Manila.

**Table 3: Training Courses Conducted, 2000–2004**

Year	Policy Making	Administrative Management	Commercial Practices Management	Engineering and Construction	Financial Management	General Management	HRD	O&M
2000	34	7	21	6	14	49	77	55
2001	59	20	1	9	41	13	9	49
2002	31	19	0	5	21	32	40	61
2003	73	49	24	7	15	31	16	77
2004	67	55	17	0	36	78	39	90
<b>Total</b>	<b>264</b>	<b>150</b>	<b>63</b>	<b>27</b>	<b>127</b>	<b>203</b>	<b>181</b>	<b>332</b>

HRD = human resources development, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

### **b. Benefit Monitoring and Evaluation Program**

15. Another part of institutional strengthening was the setting up of a BME program in the water districts to monitor the effectiveness of each subproject. This system, already developed by the LWUA under previous ADB financed projects, was to have been implemented within 6 months of loan effectiveness.

16. During the ADB Midterm Review Mission (footnote 12) carried out from March to July 2001, it was decided to include the BME within the project performance monitoring system (PPMS) under the consultant's scope of work. The PPMS at that date was almost complete as a stand-alone system in a Microsoft Access Data Base environment. However, it was incompatible with the system being developed in the LWUA Management Information System Division (MISD).<sup>14</sup> It therefore had to be converted to another operating system (Oracle) following a request by the LWUA on August 2003 and was completed only at the very end of the Project, after the loan closing date. The PPMS was therefore not used for its original purpose of project performance monitoring.<sup>15</sup> The PPMS is currently operational, although it is running on a stand-alone computer and is not integrated with the LWUA's management information system (MIS). Although data are collected from monthly data sheets submitted by the water districts, this information is not entered into the PPMS. Socioeconomic data is not collected.

### **c. Consulting Services**

17. Consulting services included support for project implementation by water districts that initially totaled 80 person-months of international consultants plus 540 person-months of local consultants. Because the loan was extended for 2 years to the end of June 2004, some of the consultancy cost items had to be realigned and technical assistance was extended from June 2002 to June 2004. The final total of consultant time was 94 person-months of foreign consultants and 630 person-months of local consultants.

## **C. Project Costs**

18. At appraisal, total project costs<sup>16</sup> were estimated at \$83.0 million equivalent. ADB was to finance \$50.0 million of this amount (60% of project costs) through a project loan, representing the entire foreign exchange cost of \$35.1 million and part of the local currency cost equivalent of

<sup>14</sup> In 1998, the LWUA was completing the installation of the loan management system (LMS); the first module of its integrated MIS. It was therefore intended that the PPMS would be the second module of the MIS. Although the PPMS would be limited to the needs of the Project, it was to be designed with the enough flexibility to allow it to be expanded so the LWUA could monitor the implementation of all ongoing subprojects.

<sup>15</sup> The system was envisioned to provide up-to-date information on the progress of subproject proposals from the time of conceptualization to approval of their financing, and to keep track of subproject implementation status, identify problems and necessary actions to be taken.

<sup>16</sup> Project cost by component is presented in Appendix 3.

\$14.9 million (31% of total local currency cost). The Government was to provide part of the local currency cost equivalent of \$33.0 million (40% of project cost) through \$24.7 million in counterpart funds from the LWUA (52% of local currency cost) and \$8.3 million equity from the water districts (17% of local currency cost).

19. Actual project costs totaled \$50.07 million equivalent, or 60% of appraisal estimate. Actual ADB financing was \$24.80 million (50% of the original loan amount and 30% of original project costs). The actual foreign exchange cost was \$17.87 million (51% of appraisal estimate) and local currency cost was \$6.93 million (14% of appraisal estimate).

20. At loan closing date, LWUA had contributed \$19.74 million, including \$7.12 million equity from water districts. To complete ongoing project activities after loan closing date, LWUA contributed an additional \$5.53 million equivalent.<sup>17</sup> In total, LWUA and water districts contributed \$25.27 million equivalent (50% of actual project costs).

21. During the initial implementation period, project costs were reduced from \$83.0 million to \$75.0 million following cancellation of two project components: (i) in part A (water supply) the scope of civil works was reduced following the withdrawal of some large and medium-sized subprojects, and (ii) part B (health education and water quality testing) was cancelled because of the existence of an equivalent program from UNICEF. The loan amount was reduced by \$5.0 million and local counterpart funding by \$3.0 million. A second reduction of \$12.0 million was requested by the LWUA for unutilized loan proceeds under (i) part A (water supply); (ii) part C: (institutional development); and (iii) interest during construction (IDC). Counterpart funding was also reduced by \$8.0 million. This brought the loan amount down to \$33.0 million and counterpart funding to \$22.0 million. A third cancellation from the loan was initiated by ADB. This totaled \$8.2 million under (i) part A; (ii) part C; and (iii) IDC, representing the undisbursed balance of the loan funds. Following these cancellations, the net loan amount was \$24.8 million, while counterpart funding was \$25.27 million. Overall project costs amounted to \$50.07 million. The revised loan allocation is presented in Appendix 4.

#### **D. Disbursements**

22. In accordance with the Loan Agreement, the LWUA was to establish an imprest fund account immediately after loan effectiveness. However, this was not done until March 2000 because of the delay in project implementation start-up activities.<sup>18</sup> ADB approved a maximum ceiling of \$2.0 million initial advance to the imprest fund, with an initial release of \$1.3 million, followed by \$0.7 million. Reimbursement and liquidation of eligible project expenditures below \$100,000 per contract was made under the statement of expenditures procedure. Loan funds were also disbursed through direct payments for consultant services, civil works contractors for large and medium-sized subprojects, and bulk procurement of pipes.

23. Initial disbursement from the loan account started in July 1998, with a 15% advance payment of the consultant's contract. The Project suffered from a delay in implementing subproject construction because of the Government's inability to release budgetary support for the Project as had been agreed (footnote 1). The LWUA resorted to local borrowing to replace the Government budgetary support. The counterpart funds disbursed by the loan closing date (\$19.74 million equivalent) comprised the initial Government support (\$0.84 million), funds from

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<sup>17</sup> The LWUA secured ₱1 billion loan from the Land Bank of the Philippines (LBP) as counterpart funding to complement national government subsidies that were approved by Congress but had not been released since 2000.

<sup>18</sup> The release of loan proceeds, through the imprest fund account, facilitated financing of project expenditures for (i) civil works contracts awarded on the basis of local competitive bidding, (ii) locally procured construction materials, and (iii) civil works carried out by the water districts.



local borrowing (\$11.78 million), and equity from water districts (\$7.12 million). After the loan closing date, the LWUA disbursed an additional \$5.53 million equivalent to complete ongoing project activities.

24. Total disbursements from loan proceeds decreased because of (i) cancellation of part B and C project components and the withdrawal of large and medium-sized subprojects; (ii) cancellation of projected unutilized loan funds before project completion date; (iii) depreciation of the Philippine peso (from ₱26.2 to \$1 at initial implementation, to ₱56 to \$1 at project completion); and (iv) cancellation of the undisbursed portion for ongoing construction activities at loan closing date.

## **E. Project Schedule**

25. According to the RRP, the Project was to be implemented over a 5-year period, from early 1997 to the end of December 2001. Actual implementation began about 2 years behind schedule. Major implementation delays were caused by (i) a delay in loan effectiveness (including a 1-year national Government debt cap); (ii) a delay of at least 1 year in start-up activities and in identifying subprojects; (iii) a delay in the engagement of consultants; (iv) the need for more time to prepare and update feasibility studies and designs; (v) uncertainties on the release of Government counterpart funds; and (vi) until mid-2001, lack of coordination within the LWUA and between LWUA and the water districts and other local and national government agencies.

26. The causes of the delays were eventually solved and project implementation proceeded as follows: (i) the loan became effective in September 1997, (ii) the project management consultants were mobilized in March 1998, (iii) feasibility studies for 15 medium-sized and large subprojects and 96 programs of work (POW) for small subprojects were completed, (iv) the LWUA secured a ₱1.0 billion loan as counterpart funding to cover national government subsidies that were approved by Congress but not released, and (v) the project management of the LWUA was streamlined after the reorganization of the project management office (PMO) in October 2001 and the appointment of an area manager as project director.

27. The PMO consultant team prepared a revised project schedule from appraisal with an accelerated rate of implementation that would increase the overall accomplishment rate and had a closing date of 30 June 2002. Time-bound action plans were also agreed with the LWUA to monitor project progress. Before the planned closing date, the LWUA reviewed the accelerated plan prepared by the PMO consultant and requested a 2-year extension of the loan closing date to 30 June 2004, which ADB approved.

28. In March 2004, through the Department of Finance (DOF) and the National Economic Development Authority (NEDA), the LWUA requested a loan cancellation of \$12.0 million, based on the actual project requirement and a final extension of loan closing date by 11 months to May 2005 so that several remaining ongoing construction activities could be fully completed.<sup>19</sup> After a careful assessment, ADB decided not to approve the request for a second extension (i) because the Project had already been extended for 2 years, and (ii) there was some uncertainty about securing the counterpart funding needed to complete the Project. A detailed program schedule comparing actual achievements until May 2005 with appraisal targets is shown in Appendix 5.

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<sup>19</sup> The request was deliberated on during the preliminary Country Portfolio Review Mission in March 2004.

## F. Implementation Arrangements

29. The LWUA was the EA for the Project and was responsible for managing and coordinating project activities with other central government agencies.<sup>20</sup> The LWUA also provided technical assistance to water districts in the design and implementation of water supply facilities. Central management and coordination of the Project was assigned to the PMO,<sup>21</sup> established under a previous ADB loan.<sup>22</sup> At the national level, the Government created a new inter-agency technical committee (IATC) to review and approve individual subprojects under the Project. The IATC was chaired by the LWUA's PMO and consisted of members from NEDA, the Department of the Interior and Local Governments (DILG), DOH, and DOF. At the water district level, field implementation units (FIUs) were established to implement the approved subprojects.<sup>23</sup> Day-to-day management of all physical infrastructure subprojects was the responsibility of the FIUs.

30. Project preparations for large and medium-sized subprojects were done by the consultant team and for small subprojects by LWUA staff. A PMO consultant was assigned as resident engineer for construction supervision of large and medium-sized subprojects. For small subprojects, the LWUA assigned its staff as resident engineers to supervise construction, and to provide technical and managerial assistance during their twice-monthly visits to water districts. The PMO organizational chart is in Appendix 6.

31. The PMO experienced difficulties until mid-2001 because of the rapid turnover of project managers and consultant team leaders. This led to lack of coordination among the LWUA's different departments, especially among the nine area managers where subprojects were located. With the appointment of a new LWUA administrator in 2001, the PMO was reorganized and a full-time project director<sup>24</sup> was appointed in October 2001. As the project director is at the same level as area managers, coordination significantly improved.

## G. Conditions and Covenants

32. The status of compliance with loan conditions and covenants is shown in Appendix 7. Out of the 26 principal covenants in the Loan Agreement, 22 were complied with, although sometimes there was a delay. Three covenants were partially complied with: (i) submission of audited financial statements for some water districts was delayed because of the delayed audit by the Commission on Audit (COA); (ii) a BME program had been prepared and implemented under other ADB-assisted projects, so it was decided to include this BME in the PPMS that was handed over to the LWUA only at project completion (socioeconomic data are not collected and the data that are collected are not entered into the PPMS); and (iii) the borrower was supposed to actively encourage nongovernment organizations (NGOs) and women to participate in the Project (involvement of NGOs did not materialize but women were actively involved in water district management at all levels, up to general manager).

<sup>20</sup> The LWUA was to have coordinated with the DOH in implementing the health and hygiene education program, but this component was cancelled following a grant to the LWUA from the JICA for a similar program.

<sup>21</sup> The PMO was headed by the senior deputy administrator of LWUA. Under the PMO, a project management unit (PMU) was responsible for the overall coordination, supervision, and monitoring of project activities, supported by a team of international and local consultants.

<sup>22</sup> ADB. 1993. *Report and Recommendation of the President to the Board of Directors for a Proposed Loan to the Republic of the Philippines for the Municipal Water Supply Project*. Manila.

<sup>23</sup> Each FIU was headed by a resident consultant engineer, including the water district's staff for the day-to-day supervision of the construction works carried out by private contractors.

<sup>24</sup> One of the area managers was appointed as a full-time project director, aided by two full-time project managers responsible for large and medium subprojects and small subprojects. While project managers undertook practical coordination work with areas concerned, the project director called for area managers' coordination meetings for regular updating and resolving common issues on the Project.

33. The covenant to provide public stand pipes for the urban poor, as envisaged in the design, was not complied with. The water districts reported that their first priority was the extension of their consumer base and reductions in NRW so they could improve their financial position. They argued that addressing the needs of the urban poor through communal facilities required programs with specific technical and financial designs.

34. All land and riparian rights and privileges required by the Project were provided in a timely manner. The EA reported that no resettlement was required.

## **H. Consultant Recruitment and Procurement**

35. The consultant recruitment and procurement procedures followed ADB's *Guidelines on the Use of Consultants* and *Procurement Guidelines*. Procedures acceptable to ADB were adopted for the prequalification of specialized consulting firms and for the tendering and awarding of the contract for consulting services. The projected number of person-months of international and local consultants had to be revised because of the extension of the loan period and the consequent extension of the consulting services contract. To remain within the original contract amount, some budget lines were reallocated or reduced.

36. Procurement of goods and other services were carried out through international competitive bidding (ICB) for large subproject contracts,<sup>25</sup> while small subproject contracts followed the local competitive bidding (LCB). Bulk procurement of pipes for small subprojects was carried out using international shopping (IS), since procurement was generally for amounts lower than \$500,000. This procedure was applied for the first nine packages. ICB was carried out for contract packages 10 to 15, and advertised in the ADB *Business Opportunities* website so bidding would be competitive. However, no bid was received from foreign bidders, while the number of local bidders decreased because of the stringent qualification criteria for ICB, especially on financial qualification. The result was a less competitive bidding process than had been anticipated.

37. Of the 103 subprojects, only five were implemented by contract, with the majority implemented by the WD's themselves, using their own equipment and human resources. Problems included (i) delays in contract awards for civil works, because the process was revised from a contract packages scheme (in the case of drilling of wells) to contracts for individual subprojects; (ii) a delay in bidding out bulk procurement of pipes, because of a change in the procurement mode from IS to ICB, which required an advertisement in the ADB *Business Opportunities* website; and (iii) rebidding of two contract packages, because the original successful bidder failed to deliver within the contract period. To avoid further delays, the LWUA decided that bulk procurement of pumps and motors would no longer be done, and such procurement would instead be included as part of civil works.

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

38. Delayed mobilization and the rapid turnover of team leaders and members reduced the effectiveness of the consultant's support. Nevertheless, the overall performance of the consultant was satisfactory.

39. No problems were recorded with regard to the performance of contractors and suppliers. Their performance was rated satisfactory.

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<sup>25</sup> ICB procedure is to be used for contracts costing more than \$2 million.

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

40. In the initial years of project implementation, the LWUA experienced several organizational problems that affected its operational performance. Its leadership and organizational structure underwent major changes that affected project operations and coordination work.

41. At the start of the Project, the LWUA did not provide permanent and organized personnel support for the Project.<sup>26</sup> There were also several changes of project directors and project managers. In 2001 the PMO was permanently set up with a project director and two project managers.

42. Uncertainty over the availability of government counterpart funding was a major issue. While an annual budget was appropriated for the LWUA, only the initial government support of \$0.84 million equivalent was disbursed to the Project. The LWUA provided counterpart funds through internal cash generation and local borrowing. This enabled the Project to proceed but resulted in a significant delay in the implementation schedule. On the other hand, there was no problem about the provision of equity by water districts. Some water districts increased their equity above the 10% minimum requirement, while others provided equity through advance implementation of their respective subprojects.

43. Including the BME in the PPMS led to considerable delay. There are still problems with that, as socioeconomic data are not collected and data that are collected are not entered into the PPMS. Monitoring of progress is carried out through monthly data sheets submitted by the water districts.

44. One very significant feature of the performance of the LWUA is the fact that, even after loan closing, it was able to fund its commitments to the remaining works of the water districts using its own funds. The performance of the borrower and EA was rated satisfactory.

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

45. During implementation, ADB fielded six review missions to evaluate the progress of policy reforms and project loan implementation.<sup>27</sup> These missions undertook field visits, consulted with beneficiaries, worked with the consultant and discussed policies necessary to facilitate and fast-track loan disbursement. During project appraisal, ADB had planned to a continuous and comprehensive monitoring of project activities through dedicated review missions to be carried out every 6 months and a midterm review mission. ADB provided a workshop on the ADB loan and the disbursement and imprest account for the PMO.

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<sup>26</sup> A key member of staff, the systems analyst who should have coordinated the activities related to the implementation of the PPMS in the Oracle platform, was not provided to assist the consultant. This has adversely affected the completion of the PPMS, which had still not been tested at loan activities closure.

<sup>27</sup> An initial mission was carried out intermittently from November–December 1998 to April 1999. This focused on detailed guidelines for procurement, capacity building and training programs, monitoring systems, a health and hygiene education program, water quality testing program, BME, and an LWUA action plan which included: (i) new organization structure, separating financial from technical functions; (ii) strengthening LWUA core financial functions; (iii) a study of private sector participation in the LWUA; (iv) water district administration; (v) development of water districts' operations; (vi) institutional strengthening for water districts; and (vii) preparation of guidelines for targeting the poor with transparent subsidies. A second mission was carried out between June and July 1999, mainly focused on project implementation status. A third mission in February–March 2000 also focused on project implementation status, particularly with regard to delay in construction start-up activities, revision of LWUA relending rates, requirements of counterpart funds, and financial capability of water districts. A fourth review mission was undertaken in March 2002, before initial loan closing date, focused on the necessity of loan extension, based on the acquired strong commitment of LWUA to the Project. The fifth mission was carried out in April to May 2003 after the loan extension. The sixth and the last loan review mission was undertaken in June 2004.

46. Review missions have taken place less frequently than initially foreseen. Six missions were carried out in 6 years. Nevertheless, the missions were carried out diligently and were quite effective. Time-bound action plans, although not always completely fulfilled, have served as a basic guideline for improving project performances. In the midterm review mission, ADB revised the time-bound action plan and the loan was extended by 24 months. More emphasis should have been placed on the timely completion of BME or PPMS, and on the collection of socioeconomic data. The performance of ADB was satisfactory.

### III. EVALUATION OF PERFORMANCE

#### A. Relevance

47. The Project is considered relevant to achieving one of the Government's development priorities, the provision of water supply to the total Philippine population by the 2010.<sup>28</sup> The Project outcome was in line with ADB's current country strategy and program (CSP)<sup>29</sup> and will accelerate progress toward the Millennium Development Goals (MDGs). Overall, the Project was relevant.

48. Implementation of most subprojects was administered by the water districts. The technical designs were prepared by the water districts with the assistance of the LWUA and were adequate and relevant. Although the Project design included community involvement in project identification and implementation through NGOs, this was not carried out.

#### B. Effectiveness in Achieving Outcome

49. The planned outcome of the Project was to provide safe, adequate, and reliable water supply and sanitation services to selected urban low-income areas in 80 small towns. The target was to provide 1 million people, 60% of them below the poverty line, with piped and safe water by 2001. Of the 80 subprojects, 37 were completed by the project closing date (30 June 2004). By the end of 2005, 90 subprojects had been completed, covering about 2.1 million additional people (see Appendix 2). The Project is assessed to have been effective in achieving its objective of providing piped and safe water. No data are available on the number of people served that live below the poverty level.

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

50. Efficiency in achieving the outcome and outputs depends on the accuracy of projections done during subproject preparation. During project appraisal, detailed evaluations were done for six subprojects. In these the financial internal rate of return (FIRR) and economic internal rate of return (EIRR) were estimated to be higher than the weighted average cost of capital (WACC) and the economic opportunity cost of capital (EOCC). Only one of these subprojects (Banga) was pursued. During the Midterm Review Mission, three subprojects were evaluated: San Francisco (large), Guimba (medium), and Bogo (small). This evaluation revealed that the subprojects continue to be viable.

51. For the PCR, nine water districts were visited and financial and economic reevaluations were undertaken. All but two subprojects (Banga and Guimba) were viable, although the resulting values were lower than during previous evaluations. Generally, the lower FIRR and EIRR values were because of (i) decreases in the number of connections, (ii) lower water tariffs,

<sup>28</sup> NEDA. 2004. *Medium Term Development Plan 2004–2010*. Manila.

<sup>29</sup> ADB. 2005. *Country Strategy and Program 2005–2007: Philippines*. Manila.

(iii) higher O&M costs, and (iv) decreased water production. A summary of results is presented in Table 4 and details are presented in Appendix 8.

**Table 4: Summary Results of Financial and Economic Evaluations**

Item	Financial analysis		Economic analysis	
	WACC	FIRR	EOCC	EIRR
Banga	12	18	12	13
Binmaley	12	23	12	21
Umingan	11	18	12	16
Guimba	13	26	12	12
Dumangas	12	21	12	21
Bogo	13	32	12	26
San Joaquin	12	17	12	25
Digos	15	32	12	26
Samal	11	27	12	34

EIRR = economic internal rate of return, EOCC = economic opportunity cost of capital,

FIRR = financial internal rate of return, WACC = weighted average cost of capital.

Source: Asian Development Bank.

52. The efficiency of fund utilization was relatively satisfactory. Of the \$24.8 million disbursed, \$3.16 million (13%) was spent on interest during construction (IDC) and commitment charges. The LWUA spent \$4.3 million (17%) for project management.

53. In the RRP, the construction of 60 wells was foreseen for the 80 target subprojects. During project implementation, a total of 157 production wells were drilled for both large and medium (7 production wells) and small subprojects (150 production wells). Most of these were financed by water district equity while others were financed either by ADB or the LWUA funds under the Project. As far as the large and medium-sized subprojects are concerned, 15 test and production wells were drilled from 2001 to 2004 under the consultancy services contract.<sup>30</sup> Of these, only seven are currently being operated. Total water production capacity for the whole Project is about 338,000 m<sup>3</sup>/day, well over the 160,000 m<sup>3</sup>/day foreseen for the 80 subprojects during appraisal. For the 103 subprojects, average investment cost per service connection (about \$400) was lower than initially foreseen (\$590). Overall, the Project is assessed to have been efficient in achieving outcome and outputs.

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

54. The overall technical sustainability of the Project is directly dependent on the technical sustainability of the individual subprojects, which again is directly dependent on the financial and human resources available within the water districts. In general, the smaller water districts will have problems carrying out proper O&M because of a lack of these resources. This is confirmed by the observations made during the PCR mission. However, the LWUA does have access to financial and human resources so should be able to guarantee the technical sustainability of the subprojects.

55. The total number of beneficiaries increased between loan closing and the PCR mission. This was mainly due to the higher number of subprojects implemented. However, detailed data for the 37 subprojects completed by loan closing show that there was a steady expansion of water service and an increase in the number of connections from about 90,000 (by June 2004) to 122,000 (by December 2005). This will increase revenues to water districts and enable them to cover their debt repayments. Increases in collection efficiency and reductions in NRW are

<sup>30</sup> A hydrogeologist or well drilling specialist was mobilized in each site to provide full-time supervision and monitoring during the whole of project implementation.

also needed.<sup>31</sup> Average collection efficiency increased from 83% to 93% between loan closing and the PCR mission (the target was 95%) while NRW increased from 19% to 26% the (target was 25%). Detailed information for the 103 subprojects is in Appendix 8. Table 5 reports the overall projected achievements as against actual achievements at loan closing date and as of December 2005. Overall, the Project is financially sustainable.

**Table 5: Accomplishment of Project Objectives**

Objectives	RRP Projection	Actual as of Loan Closing	Actual as of PCR
Completed Subprojects/Water Districts	80	37	103
Large and Medium-sized	25	3	5
Small	55	34	98
Total Served Population	1,000,000	533,000	2,105,000
Total House Connections	200,000	85,000	401,000
Total Water Production (m <sup>3</sup> /day)	160,000	69,000	338,000
Percentage NRW	25	21	26
Percentage Collection Efficiency	95	83	92

NRW = nonrevenue water, PCR = project completion report, RRP = report and recommendation of the President, Source: Local Water Utilities Administration.

56. The Project has also achieved institutional sustainability, as demonstrated by the fact that project implementation continued after the loan closing date. Overall, the Project is assessed as likely to be sustainable.

## E. Impact

57. Generally, the subprojects will have positive socioeconomic impacts, such as (i) increased access to safe potable water, contributing to a reduction in the incidence of water-borne diseases, (ii) elimination of the time consumed by fetching water from unprotected sources, (iii) creation of favorable conditions for enhanced commercial activities, (iv) reduction in fire damage because of the provision of fire hydrants, and (v) creation of temporary jobs during construction and operation.

58. The potential negative impacts envisaged during the construction phase were (i) dust and traffic during excavation works, (ii) aggravated flooding due to mud and silt deposits or to obstructions to existing drainage systems, and (iii) noise from mechanical equipment and hydraulic hammers. These inconveniences to the population were mitigated by scheduling noisy works in order to limit disturbances to the community, particularly to schools, hospitals, and offices.

59. The expected negative impacts due to the operation of the Project are (i) exploitation of natural water resources which could diminish their availability, and, in some cases, affect their quality (although the sources were carefully selected during preparation of the subprojects possible uncontrolled water abstraction from the same source by other parties in future could diminish supply and quality); (ii) increased water usage will lead to more gray wastewater in urban areas that currently lack sewage collection systems, thereby polluting rivers and gullies crossing the service areas; and (iii) a greater load to septic tanks implies an increase in effluent ground percolation, causing health hazards in areas where shallow wells are still in use.

60. All water districts were required to apply for environmental compliance certificates (ECC) or certificates of noncoverage (CNC) with the Department of Environment and Natural

<sup>31</sup> Three additional indicators were looked into for the nine subprojects revisited during the PCR. These are water districts' ability to implement proposed increases in water tariff as indicated in the appraisal reports and the debt service ratio. Detailed results are discussed in Appendix 8.

Resources (DENR). The application was made by the water districts immediately after completion of an initial environmental examination (IEE). Most of the subprojects require only a CNC, since most of the systems involve simple, appropriate and low-cost technology with very little water volume required for the coverage area (generally rural or secondary urban sites). The LWUA monitored initial evaluations by DENR to ensure that no major environmental issue had been identified. If there was none and the subproject would require only a CNC, construction was started simultaneously with the application process to avoid any delay in implementation.

61. Higher water tariffs are another socioeconomic impact of the Project as they may be beyond the poorer sector of the population's ability to pay. This is being monitored by the LWUA each time the water districts implement tariff increases.

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

##### **A. Overall Assessment**

62. Project implementation was delayed because of the uncertainty of local counterpart funding. Overall, the Project is rated successful despite the large number of subprojects still under construction at loan closing date. These were completed using LWUA financial sources which, however, resulted in a higher cost to both the LWUA and the water districts because of higher borrowing rates. Nevertheless, because there is a strong sense of ownership of the Project by the LWUA and of the subprojects by the water districts, the Project objectives were still achieved. The total number of subprojects implemented under STWSSP was 103, which was higher than projected during project appraisal, despite the fact that the total amount of the loan was not fully utilized. The total served population was also more than double the initial target of 1 million.

##### **B. Lessons Learned**

63. The major issue affecting implementation of the Project was the unavailability of national counterpart funding, which was beyond the control of the EA. The Government had given assurance that adequate funds for the Project would be allocated and released within the implementation schedule. Possible lack of counterpart funds was identified as a risk in project design and mitigating measures should have been identified so options are readily available if problems occur during implementation.

64. The larger water districts seem to be able to implement projects efficiently, financed by a combination of their own equity, internally generated funds, and loans. This opens the possibility of direct subsovereign lending.

65. The objective of providing water to low-income populations by providing public stand pipes appears to run counter to the objective of the water districts becoming financially viable. This was the reason given by the water districts for not including public stand pipes in the design of their water supply systems. The requirements to involve NGOs and to set specific targets for the number of beneficiaries living below the poverty line, appear to have been unrealistic in water districts whose first priority is to achieve financial viability.

66. As far as exploitation of new water sources is concerned, firmer assurances on their availability should have been obtained before completion of detailed engineering design. This was particularly true for the eight large or medium-sized subprojects in the province of Bulacan that were relying on the Bulacan bulk water supply scheme. The cancellation of this scheme led to the cancellation of the eight subprojects after much work had been undertaken.



67. The LWUA should have provided additional institutional and capability building support to newly established and small water districts to ensure the viability and sustainability of the investments. There is a need to further strengthen the small water districts' capacity to operate their water systems.

68. When project components are transferred to other projects or programs, financed by external parties or the EA itself, the EA should be obliged to report on the output of these project components, since these form an essential input in achieving the Project outcome.

69. The project performance monitoring system (PPMS) was initially planned to be a management tool to allow the LWUA to undertake efficient monitoring of the implementation status of all ongoing subprojects. The completion of the system should have been prioritized in the first part of the Project to ensure that it would be available and operational during project implementation and not just an output after project completion.

## **C. Recommendations**

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

70. Activities requiring follow-up include the following.

- (i) The LWUA should continue activities in the 13 water districts where construction is still being carried out until subproject completion.
- (ii) The PPMS should be fully integrated with the LWUA management information system (MIS) and used in its monitoring activities. Full-time staff should be appointed to operate the system.
- (iii) Water districts should submit monthly data sheets (MDSs) and audit financial statements (AFS) regularly so the LWUA is provided with basic information and indicators on the operations of water districts.
- (iv) The LWUA should continuously monitor implementation of water tariffs, paying particular attention to their affordability and sustainability.
- (v) The LWUA should provide continuous support to small and newly established water districts such as Banga and San Joaquin. Scaling up of operations through mergers should be considered where feasible, in order to benefit from economies of scale.
- (vi) The LWUA should provide technical support to the eight water districts in Bulacan that were affected by the cancellation of the Bulacan bulk water supply scheme. Further studies must be done to assist these water districts to identify alternative financing schemes for the development of a bulk water source in Bulacan.

### **2. General**

71. Based on the key lessons learned from the review of the Project, some general recommendations are made for future ADB projects.

- (i) Future projects should ensure the Government's sustained commitment to providing counterpart funding. Options should be identified in case of unforeseen problems during project implementation. This could include other funding sources

(such as domestic borrowing), increases in water districts' equity, or less rigid use of ADB funds.

- (ii) Before detailed engineering studies, important aspects such as the feasibility of identified water sources should be ensured.
- (iii) Activities to achieve specific objectives (such as the provision of water supply to the low-income sector of the community) should be identified during preparation, included in the design, and monitored during subproject implementation. Alternative technical and financial schemes that are in line with the objective of financial sustainability of the water districts need to be identified.



Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions and Risks
<ul style="list-style-type: none"> <li>• health and hygiene education</li> </ul> <p>3. Project Management</p>	<p>hygiene education programs</p> <p>Establish project management systems and an interagency technical committee. Only subprojects that are found financially viable will be endorsed for implementation.</p>	<p>Project progress reports and review missions</p>	<p>NGOs not effective</p> <p>Community wishes, priorities and constraints are not adequately taken into account</p> <p>Project office not set up on time</p> <p>Project director is not competent</p> <p>Consultants are not competent</p> <p>Poor coordination of components</p> <p>Counterpart funds are not available on a timely basis</p>
<p><b>Activities</b></p> <p>1. Community organized and strengthened</p> <p>Urban water supply and sanitation</p> <ul style="list-style-type: none"> <li>• Surveys and investigation</li> <li>• Construction of water supply wells and facilities</li> </ul> <p>Primary health care and water quality control</p> <ul style="list-style-type: none"> <li>• Health and hygiene education</li> <li>• Construction of new laboratories</li> </ul> <p>2. Communities organized and strengthened</p> <ul style="list-style-type: none"> <li>• Capacity-building program</li> <li>• Benefit monitoring evaluation</li> </ul> <p>3. Project Management</p> <ul style="list-style-type: none"> <li>• Appointment of implementation consulting services</li> </ul>	<p><b>Inputs</b></p> <p>\$1.5 million</p> <p>\$60.3 million</p> <p>\$0.2 million</p> <p>\$1.4 million</p> <p>\$1.0 million</p> <p>\$0.1 million</p> <p>Foreign – 80 person-months - \$1.6 million</p> <p>Local – 540 person-months - \$3.3 million</p> <p>Total cost - \$83.0 million (including interest during construction)</p>	<p>Project progress reports and review missions</p> <p>Project progress reports and review missions</p> <p>Project progress reports and review missions</p>	<p>Right of way acquisition delays schedule</p> <p>water districts and local government units cannot deliver counterpart staff</p> <p>Delays in establishing subproject field implementation units</p>

## DETAILED DATA ON STWSSP SUBPROJECTS

No.	Area	Water Districts	Province	Date of Completion	Date of MDS <sup>a</sup>	Service Connections		Population Served		Minimum Tariff for Domestic Conn. (p/m <sup>3</sup> )		Collection Efficiency (%)		Water Production (m <sup>3</sup> /day)		Nonrevenue Water (%)	
						Actual	Dec. '05	Actual	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05
						Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05
<b>I. Small Subprojects</b>																	
<b>A. Completed Prior to Loan Closing Date (June 2004)</b>																	
1	1	Metro Bangued	Abra	Dec-03	Apr-04	4,185	5,321	25,110	27,264	13.20	15.40	92	98	3,460	3,479	10	20
2	1	Penablanca <sup>b</sup>	Cagayan	Sep-03	Mar-04	648	648	3,888	3,888	11.50	11.50	68		412	412	28	
3	1	San Manuel	Isabela	Nov-03	May-04	1,014	1,314	6,084	7,227	14.00	17.00	79	84	433	713		17
4	1	Asingan	Pangasinan	Nov-03	Jun-04	1,755	2,181	10,453	13,086	22.00	22.00	94	97	984	1,161	14	13
5	1	Balungao	Pangasinan	May-02	Jun-04	949	912	4,642	5,148	13.50	19.00	88	90	756	804	14	41
6	1	Bayambang	Pangasinan	Oct-02	Apr-04	3,016	4,034	17,361	19,494	16.80	19.90	97	95	2,314	3,408	22	35
7	1	Binmaley	Pangasinan	Mar-03	Jun-04	6,663	7,792	39,978	42,732	12.00	14.90	95	96	4,905	4,943	16	10
8	1	Metro Tayug	Pangasinan	Feb-04	Jun-04	779	1,286	5,874	6,270	16.70	18.60	71	80	750	1,018	38	42
9	1	San Manuel	Pangasinan	Jan-02	Mar-04	774	1,005	4,644	5,382	13.20	17.00	89	93	621	641	8	11
10	1	Santa Maria <sup>b</sup>	Pangasinan	May-02	Jun-04	1,087	1,087	6,522	6,522	13.20	13.20	100		797	797	16	
11	1	Umingan	Pangasinan	Jul-02	May-04	1,012	1,482	5,897	8,151	18.60	24.00	90	96	1,200	1,097	39	41
12	2	Dinalupihan	Bataan	Sep-03	Jul-04	4,478	5,638	23,855	28,190	12.25	12.25	92	92	3,615	4,406	7	10
13	2	Bongabon	Nueva Ecija	Sep-03	Jun-04	1,179	1,601	7,074	7,416	15.50	20.50	84	87	920	687	23	22
14	2	Camiling	Tarlac	Jun-04	May-04	5,052	6,760	26,509	35,472		19.50		96	4,311	4,445		19
15	3	Camalig	Albay	Jul-03	Feb-04	951	951	4,927	4,927	13.70	13.70	54		1,033	1,033		
16	3	Jose Panganiban	Camarines Norte	Feb-04	May-04	502	1,259	3,536	6,924	16.00	23.00	75	94	233	488		7
17	3	Nabua	Camarines Sur	Jul-03	Jun-04	1,508	2,032	9,795	10,394	17.40	17.40	95	94	1,000	1,030		17
18	3	Paracale	Camarines Sur	Apr-04	Apr-04	1,246	1,804	8,722	8,764	15.84	17.50	72	78	1,170	1,327		
19	3	Atimonan	Quezon	Mar-04	Jun-04	1,462	2,019	6,860	11,104	21.60	24.84	87	92				
20	3	Tagkawayan	Quezon	May-04	May-04	1,645	2,243	13,494	14,580	17.16	20.50	96	97	1,133	1,119	6	12
21	3	Odiangan	Romblon	Jan-04	Apr-04	1,488	2,063	7,440	8,395	8.83	10.00	83	97		1,589		29
22	4	Pasacao	Camarines Sur	Apr-04	Feb-04	819	7,936	6,536	8,264	13.90	23.50	71	99				
23	5	Pontevedra	Capiz	Mar-04	Jun-04	1,206	2,039	8,743	7,395	20.60	25.00	83	92		1,127		53
24	5	Bogo	Cebu	Sep-03	May-04	2,375	2,929	11,875	14,645	11.70	11.70	100	98	1,641	1,715		6
25	5	Dumangas BN <sup>b</sup>	Iloilo	Feb-04	Jun-04	3,429	4,289	24,675	23,590	18.20	21.80	93	95	3,184	2,202		22
26	7	Buenavista	Agusan del Norte	Oct-02	May-04	1,168	1,827	7,874	10,154	13.00	17.50	27	93	755	920		14
27	7	Nasipit 2	Agusan del Sur	Dec-03	May-04	2,826	3,979	22,764	21,884	13.10	15.80	94	96	3,939	3,291		45
28	7	Maramag	Bukidnon	Oct-01	May-04	2,987	3,892	19,416	21,406	10.00	11.00	85	92	3,142	3,763		50
29	7	Balingasag	Misamis Oriental	Dec-02	May-04	1,089	1,747	7,046	9,762	16.00	17.60	81	92	1,286	1,767		21
30	7	Bislig	Surigao del Sur	Mar-04	Jun-04	8,021	9,525	42,893	52,400	13.50	15.50	66	95	5,683	6,210		31
31	7	Tandag <sup>b</sup>	Surigao del Sur	Feb-04	Jun-04	3,671	3,671	29,925	29,925	14.40	14.40	92					
32	8	Digos	Davao del Sur	Dec-03	May-04	9,423	11,684	65,961	68,880	12.86	18.39	98	94	8,040	8,314		22
33	8	Banga	So. Cotabato	Feb-04	Apr-04	296	590	1,422	2,751	15.00	15.00	74	97	547	309		47
34	9	Maluso	Basilan	Jun-04	Jun-04	1,413	1,628	7,876	8,954	9.50	11.90	47	64	1,296	1,275		29

No.	Area	Water Districts	Province	Date of Completion	Date of MDS <sup>a</sup>	Service Connections		Population Served		Minimum Tariff for Domestic Conn. (p/m <sup>3</sup> )		Collection Efficiency (%)		Water Production (m <sup>3</sup> /day)		Nonrevenue Water (%)	
						Actual		Actual		Actual		Actual		Actual		Actual	
						Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05
<b>B. Completed After Loan Closing Date (June 2004) to March 2006</b>																	
35	1	Sta. Ana	Cagayan	Dec-05													
36	1	Sarrat	Ilocos Norte	Apr-05			939		3,822		18.40		0.95		372		15
37	1	Naguillan	La Union	Sep-04			1,715		7,015		17.50		0.96		1,121		26
38	1	Alcala	Pangasinan	Aug-04											928		
39	1	Manaoag	Pangasinan	Dec-04			4,049		20,634		15.00		94		3,296		26
40	1	Pozorubio	Pangasinan	Dec-04			2,197		13,182		15.00		97		1,411		23
41	1	San Carlos	Pangasinan	Aug-05			5,871		32,290		16.70		94		6,700		39
42	1	San Quintin	Pangasinan	Sep-05			684		4,104		20.50		95		339		18
43	2	Norzagaray	Bulacan	Dec-04			4,579		24,894		15.00		94		4,093		43
44	2	San Rafael	Bulacan	Feb-05			4,560		19,980		17.50		95		2,444		15
45	2	Sta. Maria	Bulacan	Jul-05			7,360		41,262		15.50		99		5,693		20
46	2	Porac	Pampanga	Apr-05													
47	2	Concepcion	Tarlac	Dec-04			4,687		25,778		12.50		96		5,102		24
48	2	Moncada	Tarlac	Dec-04			3,119		17,154		15.00		95		2,468		25
49	3	Mabini	Batangas	Nov-05			3,311		20,412		14.00		100		2,516		25
50	3	Tanauan	Batangas	Feb-05			10,088		52,787		20.32		93		10,650		42
51	3	Carmona	Cavite	Oct-04											2,165		
52	3	GMA	Cavite	Oct-04			8,089		48,534		21.20		91		7,053		30
53	3	Laguna	Laguna	Jul-05											17,023		
54	3	San Pedro	Laguna	Jun-05			21,428		128,568		17.03		93		16,958		9
55	3	San Jose	Occ. Mindoro	Jan-05			5,612		30,866		14.50		97		5,434		31
56	3	Polilio Island	Quezon	Mar-06			793		4,361		5.00		91				
57	3	Morong	Rizal	Dec-05			8,278		33,145		19.00		98		6,289		22
58	3	Pililla	Rizal	Sep-04			4,094		17,900		16.00		93		3,967		39
59	3	San Gabriel, Teres	Rizal	Oct-05			2,968		17,808		16.00		97		1,932		13
60	4	Bato	Camarines Sur	Apr-05			1,893		10,411		12.10		94		1,647		36
61	4	Calabanga	Camarines Sur	Aug-05			1,567		4,242		21.40		87		864		
62	4	Metro Naga	Camarines Sur	Feb-06			28,097		154,533		10.50		92		36,622		27
63	4	Donsol	Sorsogon	Feb-06			1,215		4,745		25.50		82		1,231		
64	5	San Joaquin	Iloilo	Dec-04			376		2,196		28.00		100		325		19
65	5	Binalbagan	Negros Occ.	Jan-06			3,428		12,980		21.50		94		2,230		42
66	5	Himamaylan	Negros Occ.	May-05			2,965		15,990		15.00		96		1,369		28
67	5	Sagay	Negros Occ.	Jan-05			6,596		32,448		17.50		96		5,288		46
68	5	Silay City	Negros Occ.	Jan-05			5,107		23,436		20.00		94		3,968		34
69	5	Sipalay	Negros Occ.	Aug-04			227		1,248		27.90		100		141		35
70	6	Carcar	Cebu	Sep-04			8,743		46,949		12.40		100		6,057		

No.	Area	Water Districts	Province	Date of Completion	Date of MDS <sup>a</sup>	Service Connections		Population Served		Minimum Tariff for Domestic Conn. (p/m <sup>3</sup> )		Collection Efficiency (%)		Water Production (m <sup>3</sup> /day)		Nonrevenue Water (%)	
						Actual		Actual		Actual		Actual		Actual		Actual	
						Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05
71	6	Borongon	Eastern Samar	Sep-04		2,787		12,756		19.00		95		932		13	
72	6	Gen. McArthur	Eastern Samar	Feb-05		newly op											
73	6	Guiuan	Eastern Samar	Mar-06		newly op											
74	6	Carigara	Leyte	Sep-05		4,677		28,062		12.12		90		3,945		22	
75	6	Sibulan	Negros Oriental	Dec-04		3,452		20,256		12.00		83		3,947		26	
76	6	Catbalogan	Samar	Feb-05		4,838		26,609		14.00		93		3,659		25	
77	7	Prosperidad	Agusan del Sur	Sep-04		1,281		7,045		14.90		93		792		18	
78	7	Claveria	Misamis Oriental	Feb-05		595		3,272		12.30		93		279		41	
79	8	BE Dujali	Davao del Norte	Sep-04		142		756		23.83		86		312			
80	8	Samal	Davao del Norte	Mar-05		2,071		11,262		15.59		96		1,371		18	
81	8	Lupon	Davao Oriental	Jul-05		1,268		5,357		19.00		92		643		17	
82	9	Siocon	Zambo Norte	Nov-05		778		4,279		14.30		95		448		16	
83	9	Sindangan	Zambo Sur	May-05		2,098		12,588		14.00		87		1,569		22	
<b>C. Ongoing Subprojects (as of April 1, 2006)</b>																	
84	3	Gen. E. Aguinaldo	Cavite	ongoing		1,637		9,003		9.60		87		1,180		19	
85	4	Daraga	Albay	ongoing		8,372		35,450		16.00		93		9,951		35	
86	4	Tabaco City	Albay	ongoing		10,888		55,608		12.20		92		14,773		24	
87	4	Bacacay	Albay	ongoing		2,058		10,972		14.00		91		979		8	
88	4	Sipocot	Camarines Sur	ongoing		2,901		15,300		11.30		90		1,775		6	
89	4	Pilar	Sorsogon	ongoing		1,250		6,526		19.20		97		876		31	
90	4	Sorsogon City	Sorsogon	ongoing		9,083		49,956		14.00		94		9,146		30	
91	5	Alimodian	Iloilo	ongoing													
92	5	Metro Iloilo	Iloilo	ongoing		27,147		149,308		15.90		100		40,866		46	
93	5	Bais City	Negros Oriental	ongoing		3,389		18,640		19.60		99		2,561		38	
94	6	Taft	Samar	ongoing		newly op											
95	8	Lebak	Sultan Kudarat	ongoing		newly op											
96	9	MOWD	Misamis Occ.	ongoing		17,637		84,764		16.00		83		17,431		54	
97	1	Lallo	Cagayan			529		3,696		17.00		43		264		4	
98	4	Aroroy	Masbate														

No.	Area	Water Districts	Province	Date of Completion	Date of MDS <sup>a</sup>	Service Connections		Population Served		Minimum Tariff for Domestic Conn. (p/m <sup>3</sup> )		Collection Efficiency (%)		Water Production (m <sup>3</sup> /day)		Nonrevenue Water (%)	
						Actual		Actual		Actual		Actual		Actual		Actual	
						Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05	Per MDS	Dec. '05
<b>II. Large and Medium Subprojects</b>																	
<b>A. Completed Prior to Loan Closing Date (June 2004)</b>																	
99	2	Guimba	Nueva Ecija	Aug-03	Jun-04	1,972	2,938	10,846	16,159	16.00	18.70	97	95		1,887		18
100	4	Pili	Camarines Sur	Aug-03	Jun-04	5,139	6,488	35,369	38,717	18.90	20.80	86	91	4,864	5,259		18
101	7	San Francisco	Agusan del Sur	Jul-03	Apr-04	3,008	3,818	15,255	21,000	12.60	15.10	83	90	4,750			
<b>B. Completed After Loan Closing (June 2004)</b>																	
102	7	Bayugan	Agusan del Sur	Nov-04			2,403		14,418		20.48		88		1,440		23
103	4	Iriga City	Camarines Sur	Feb-05			9,284		53,606		14.50		95		8,187		29
<b>Grand Total</b>						<b>90,235</b>	<b>407,612</b>	<b>561,141</b>	<b>2,150,379</b>	<b>14.78</b>	<b>16.84</b>	<b>83</b>	<b>92</b>	<b>69,174</b>	<b>367,658</b>	<b>19</b>	<b>26</b>

MDS = monthly data sheet.

<sup>a</sup> MDS are reports submitted by all water districts to the Local Water Utilities Administration (LWUA). For estimating the various data at Project completion date, the latest available MDS before project completion (June 2004) was used.

<sup>b</sup> MDS for December 2005 is not available, thus, data during project completion was used (except for collection efficiency and nonrevenue water).

Source: Local Water Utilities Administration.

<b>Summary</b>																	
<b>Completed Prior to Loan Closing Date (June 2004)</b>						<b>90,235</b>	<b>122,412</b>	<b>561,141</b>	<b>637,216</b>	<b>14.78</b>	<b>17.44</b>	<b>83</b>	<b>92</b>	<b>69,174</b>	<b>77,386</b>	<b>19</b>	<b>25</b>
Small subprojects						80,116	109,168	499,671	561,340	14.69	17.38	82	92	59,560	65,490	19	25
Medium and large subprojects						10,119	13,244	61,470	75,876	15.83	18.20	89	92	9,614	7,146		18
<b>Completed After Loan Closing Date to March 2006</b>						<b>200,309</b>		<b>1,073,940</b>		<b>16.81</b>		<b>94</b>		<b>195,899</b>		<b>26</b>	
Small subprojects						188,622		1,005,916		16.77		94		185,593		26	
Medium and large subprojects						11,687		68,024		17.49		92		9,627		26	
<b>Total Completed as of April 2006</b>						<b>322,721</b>		<b>1,711,156</b>		<b>17.10</b>		<b>93</b>		<b>273,285</b>		<b>26</b>	
<b>Total Ongoing as of April 2006</b>						<b>84,891</b>		<b>439,223</b>		<b>14.98</b>		<b>88</b>		<b>99,802</b>		<b>27</b>	

Source: Local Water Utilities Administration.



## ESTIMATED AND ACTUAL PROJECT COST BY COMPONENT (\$ million)

Component	Total Project Cost (Appraisal)			Appraisal <sup>a</sup>							Actual						Actual						Total Project Cost (Actual)						
				ADB Financing			Government Financing				ADB Financing			Gov't Financing upto Loan Closing <sup>c</sup>			Gov't Financing after Loan Closing <sup>d</sup>												
	Foreign	Local	Total	Foreign	Local <sup>b</sup>	Total	Foreign	Local	WDS	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total				
<b>A. Water Supply</b>																													
1. Land	0.00	1.17	1.17	0.00	0.00	0.00	0.00	1.20	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2. Civil Works				15.50	11.37	26.87	0.00	18.57	2.06	20.63	6.70	4.87	11.39	0.00	11.87	7.12	18.99	5.53	0.00	5.53	24.52	6.70	29.39	36.09					
a. Drilling of wells by contractors	0.92	1.85	2.77																										
b. Civil works (by contracts)	12.75	19.94	32.69																										
c. Civil works by water districts (by force account)	1.85	10.15	12.00																										
<b>Subtotal</b>	<b>15.52</b>	<b>31.94</b>	<b>47.46</b>	<b>15.50</b>	<b>11.37</b>	<b>26.87</b>	<b>0.00</b>	<b>19.77</b>	<b>2.06</b>	<b>20.63</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>11.87</b>	<b>7.12</b>	<b>18.99</b>	<b>5.53</b>	<b>0.00</b>	<b>5.53</b>	<b>24.52</b>	<b>6.70</b>	<b>29.39</b>	<b>36.09</b>					
3. Equipment and Materials				10.20	0.23	10.43	0.00	1.17	0.00	1.17				5.64	0.13	5.77	0.00	0.64	0.00	0.64	0.00	0.00	0.00	0.64	5.64	0.77	6.41		
a. Pipes and fittings	4.16	0.46	4.62																										
b. Pumps and motors	1.39	0.15	1.54																										
c. Water meters	2.78	0.30	3.08																										
d. Office equipment	0.28	0.03	0.31																										
e. Stored materials	1.60	0.47	2.07																										
<b>Subtotal</b>	<b>10.21</b>	<b>1.41</b>	<b>11.62</b>	<b>10.20</b>	<b>0.23</b>	<b>10.43</b>	<b>0.00</b>	<b>1.17</b>	<b>0.00</b>	<b>1.17</b>	<b>5.64</b>	<b>0.13</b>	<b>5.77</b>	<b>0.00</b>	<b>0.64</b>	<b>0.00</b>	<b>0.64</b>	<b>0.00</b>	<b>0.00</b>	<b>0.64</b>	<b>0.00</b>	<b>0.00</b>	<b>0.64</b>	<b>5.64</b>	<b>0.77</b>	<b>6.41</b>			
4. Studies and construction management by administration	0.00	1.54	1.54	0.00	0.00	0.00	0.00	1.50	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Subtotal (A)</b>	<b>25.73</b>	<b>36.06</b>	<b>61.79</b>	<b>25.70</b>	<b>11.60</b>	<b>37.30</b>	<b>0.00</b>	<b>22.44</b>	<b>2.06</b>	<b>24.50</b>	<b>5.64</b>	<b>0.13</b>	<b>5.77</b>	<b>0.00</b>	<b>12.51</b>	<b>7.12</b>	<b>19.63</b>	<b>5.53</b>	<b>0.00</b>	<b>5.53</b>	<b>25.16</b>	<b>12.34</b>	<b>30.16</b>	<b>42.50</b>					
<b>B. Health Education and Water Testing</b>																													
1. Health and hygiene education program	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2. Water quality testing program				1.00	0.00	1.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
a. Training of staff and conduct testing	0.00	0.02	0.02																										
b. Civil works	0.00	0.18	0.18																										
c. Procurement of equipment																													
(i) Equipment for water analysis laboratories	0.56	0.06	0.62																										
(ii) Chemicals and reagents	0.07	0.01	0.08																										
(iii) Portable water analysis kits	0.41	0.05	0.46																										
d. Land	0.00	0.16	0.16																										
<b>Subtotal (B)</b>	<b>1.04</b>	<b>0.56</b>	<b>1.60</b>	<b>1.00</b>	<b>0.00</b>	<b>1.00</b>	<b>0.00</b>	<b>0.60</b>	<b>0.00</b>	<b>0.60</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>C. Institutional Development</b>																													
1. Capacity building program				0.10	0.00	0.00	0.00	0.81	0.09	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
a. training of water districts' staff	0.00	0.96	0.96																										
(i) LWUA's project management staff	0.06	0.03	0.09																										
<b>Subtotal</b>	<b>0.06</b>	<b>0.99</b>	<b>1.05</b>	<b>0.10</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.81</b>	<b>0.09</b>	<b>0.90</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
2. Benefit monitoring and evaluation	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3. Consulting services	1.60	3.25	4.85	1.60	3.30	4.90	0.00	0.00	0.00	0.00	2.37	1.93	4.30	0.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.11	2.37	2.04	4.41			
<b>Subtotal (C)</b>	<b>1.66</b>	<b>4.31</b>	<b>5.97</b>	<b>1.70</b>	<b>3.30</b>	<b>4.90</b>	<b>0.00</b>	<b>0.91</b>	<b>0.09</b>	<b>1.00</b>	<b>2.37</b>	<b>1.93</b>	<b>4.30</b>	<b>0.00</b>	<b>0.11</b>	<b>0.00</b>	<b>0.11</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.11</b>	<b>2.37</b>	<b>2.04</b>	<b>4.41</b>			
<b>D. Interest During Construction</b>	<b>6.68</b>	<b>6.96</b>	<b>13.64</b>	<b>6.70</b>	<b>0.00</b>	<b>6.70</b>	<b>0.00</b>	<b>6.90</b>	<b>0.00</b>	<b>6.90</b>	<b>3.16</b>	<b>0.00</b>	<b>3.16</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>3.16</b>	<b>0.00</b>	<b>3.16</b>			
<b>TOTAL (A+B+C+D)</b>	<b>35.11</b>	<b>47.89</b>	<b>83.00</b>	<b>35.10</b>	<b>14.90</b>	<b>50.00</b>	<b>0.00</b>	<b>30.85</b>	<b>2.15</b>	<b>33.00</b>	<b>17.87</b>	<b>2.06</b>	<b>24.80</b>	<b>0.00</b>	<b>12.62</b>	<b>7.12</b>	<b>19.74</b>	<b>5.53</b>	<b>0.00</b>	<b>5.53</b>	<b>25.27</b>	<b>17.87</b>	<b>32.20</b>	<b>50.07</b>					
Percent	42.30	57.70	100.00	1.00	0.31	0.60		0.64	0.04	0.69	0.51	0.04	0.30	0.00			0.41						0.53						

LWUA = Local Water Utilities Administration, WD = water districts.

<sup>a</sup> August 1996 price level.

<sup>b</sup> Local cost includes duties and taxes estimated at \$6.4 million equivalent or 10 percent of civil works, equipment, materials and consulting services.

<sup>c</sup> Average exchange rate of P54.72 per \$1.

<sup>d</sup> LWUA completed remaining subproject activities after Loan closing date upto May 2005, using funds from internal cash generation and local borrowings.

Source: Local Water Utilities Administration

**REVISED LOAN ALLOCATIONS**  
(\$'000)

Category	Original Allocation			First Revised Allocation			Second Revised Allocation			Last Revised Allocation		
	ADB	LWUA/ WD	Total Cost	ADB	LWUA/ WD	Total	ADB	LWUA/ WD	Total	ADB	LWUA/ WD	Total
<b>A. Water Supply Facilities</b>	<b>37,300</b>	<b>24,600</b>	<b>61,900</b>	<b>33,300</b>	<b>25,100</b>	<b>58,400</b>	<b>25,130</b>	<b>21,800</b>	<b>46,930</b>	<b>17,337</b>	<b>25,270</b>	<b>42,607</b>
Civil Works	26,900	23,560	50,460	22,900	24,000	46,900	16,560	20,850	37,410	11,567	24,630	36,197
Materials and Equipment	10,400	1,040	11,440	10,400	1,100	11,500	8,570	950	9,520	5,770	640	6,410
<b>B. Health Education and Water Quality Testing</b>	<b>1,000</b>	<b>600</b>	<b>1,600</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Health and Hygiene Education Program	0	100	100	0	100	100	0	0	0	0	0	0
Water Quality Testing Program	1,000	500	1,500	0	0	0	0	0	0	0	0	0
<b>C. Institutional Development</b>	<b>5,000</b>	<b>900</b>	<b>5,900</b>	<b>5,000</b>	<b>200</b>	<b>5,200</b>	<b>4,714</b>	<b>200</b>	<b>4,914</b>	<b>4,309</b>	<b>0</b>	<b>4,309</b>
Capacity-Building Program	100	900	1,000	100	200	300	94	0	94	0	0	0
Consulting Services	4,900	0	4,900	4,900	0	4,900	4,620	0	4,620	4,309	0	4,309
<b>D. Interest During Construction</b>	<b>6,700</b>	<b>6,900</b>	<b>13,600</b>	<b>6,700</b>	<b>4,600</b>	<b>11,300</b>	<b>3,156</b>	<b>0</b>	<b>3,156</b>	<b>3,155</b>	<b>0</b>	<b>3,155</b>
<b>Total</b>	<b>50,000</b>	<b>33,000</b>	<b>83,000</b>	<b>45,000</b>	<b>30,000</b>	<b>75,000</b>	<b>33,000</b>	<b>22,000</b>	<b>55,000</b>	<b>24,801</b>	<b>25,270</b>	<b>50,071</b>

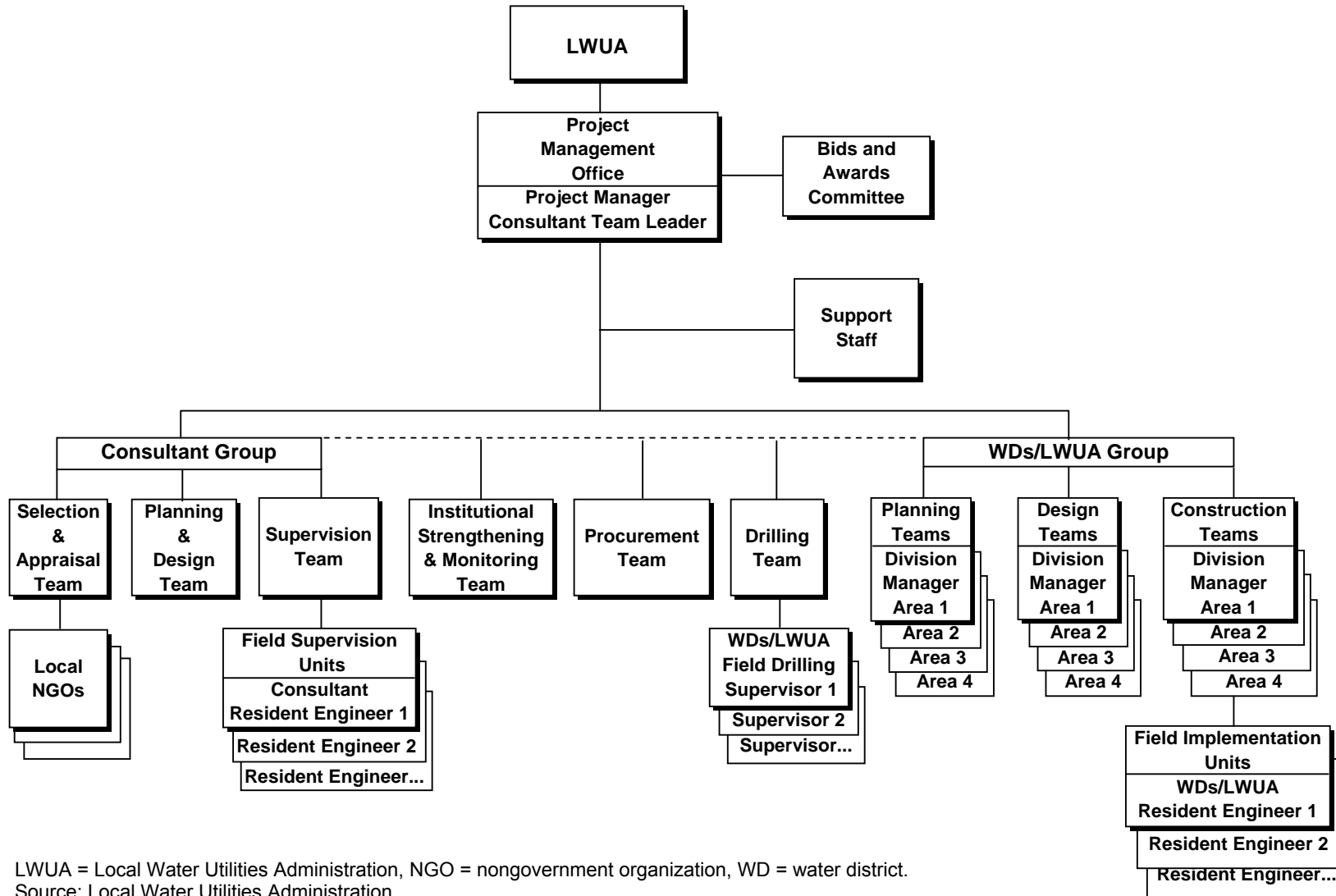
ADB = Asian Development Bank, LWUA = Local Water Utilities Administration, WD = water district.

Source: Asian Development Bank and Local Water Utilities Administration.





## ORGANIZATION CHART PROJECT MANAGEMENT UNIT



LWUA = Local Water Utilities Administration, NGO = nongovernment organization, WD = water district.  
Source: Local Water Utilities Administration.

## STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Loan Agreement	Status of Compliance
Amounts of the loan may be withdrawn from the loan account only for the purpose of financing (i) Subprojects Under Part A of the Project; (ii) eligible expenditures under Part C of the Project; and (iii) interest and commitment charge on the loan during the construction period of the Project. Except as the borrower and Asian Development Bank (ADB) may otherwise agree, all Subprojects to be financed under the Loan shall satisfy the criteria agreed with ADB, and follow the approval procedure, specified in paragraphs 3 and 4 of schedule 5 to this Loan Agreement,	Article III, Section 3.02 (a) and (b)	Complied with. 123 subprojects were approved by the Inter-Agency Technical Committee; 104 were implemented (6 large and medium-sized and 98 small). As of loan closing date, 3 large and medium-sized and 34 small subprojects were completed.
The borrower shall make available, or cause the water districts (WD) to make available, promptly as needed, the funds, facilities, services, land and other resources which are required, in addition to the proceeds of the loan, for the carrying out of the Project, and for the operation and maintenance of the Project facilities.	Article IV, Section 4.02	Complied with. In some subprojects, the unavailability of land meant that some structures had to be relocated at the last moment, sometimes with consequences on final system performances (e.g., Iriga Water District).
In the carrying out of the Project, the borrower shall employ competent, or cause to be employed, competent and qualified consultants and contractors, acceptable to the borrower and the ADB, to an extent and upon terms and conditions satisfactory to the borrower and the ADB.	Article IV, Section 4.03 (a)	Complied with. Consultants and contractors were engaged. Procurement of civil works and materials were carried out although with some delays. Contractors complied with their contracts without major problems, but with some delays.
The borrower shall cause the WDs to take out and maintain with responsible insurers, or make arrangements satisfactory to the ADB for, insurance against risks and in such amounts as shall be consistent with sound practice.	Article IV, Section 4.05 (a)	Complied with.
The borrower shall maintain, and cause the WDs to maintain, records and accounts adequate to identify the goods and services and other items of expenditures financed out of the proceeds of the loan, to disclose the use thereof in the Project, to record the progress of the Project (including the cost) and to reflect, in accordance with consistently maintained sound accounting principles, the respective operations and financial condition of the borrower and the WDs.	Article IV, Section 4.06 (a)	Complied with through continuous monitoring of activities and expenditures, carried out by resident engineers and Local Water Utilities Administration (LWUA) Administrative Department.

Covenant	Reference in Loan Agreement	Status of Compliance
<p>The borrower shall (i) have its and the WDs' accounts and financial statements audited annually, in accordance with sound auditing standards, by independent auditors whose qualifications, experience and terms of reference are acceptable to the ADB; (ii) furnish to ADB, as soon as available but in any event not later than 12 months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the covenants of the Loan), all in the English language; and (iii) furnish to the ADB such further information concerning such accounts and financial statements, and the audit thereof, as the ADB shall from time to time reasonably request.</p>	<p>Article IV, Section 4.06 (b)</p>	<p>Partially complied with. Disbursements began in 2001 and the first audited financial statements were due on 31 December 2002. However, the audits of some water districts by the Commission on Audit were delayed and were conducted annually.</p>
<p>The borrower shall furnish, or cause to be furnished, to the ADB quarterly reports on the carrying out of the Project and on the operation and management of Project facilities, in such form and in such detail and within such a period as the ADB shall reasonably request, and shall indicate, among other things, progress made and problems encountered during the quarter under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following quarter.</p>	<p>Article IV, Section 4.07 (b)</p>	<p>Complied with. Since April 2002, it was agreed that the borrower should submit a monthly progress report.</p>
<p>Promptly after physical completion of the Project, but not later than 3 months thereafter or such later date as may be agreed for this purpose between the borrower and the ADB, the borrower shall prepare and furnish to the ADB a report, in such form and in such detail as the ADB shall reasonably request, on the execution and initial operation of the Project, including its cost, the performance by the borrower of its obligations under this Loan Agreement and the accomplishment of the purposes of the loan.</p>	<p>Article IV, Section 4.07 (c)</p>	<p>Complied with. A project completion report by the Government was submitted to ADB.</p>
<p>Each civil works contract estimated to cost the equivalent of \$2,000,000 or more and each supply contract for equipment or materials estimated to cost the equivalent of \$500,000 or more shall be awarded on the basis of international competitive bidding as described in Chapter II of the <i>Guidelines for Procurement. Bidders</i> for civil works shall be prequalified before bidding.</p>	<p>Schedule 3, para. 4 (a)</p>	<p>Complied with.</p>

Covenant	Reference in Loan Agreement	Status of Compliance
<p>Civil works contracts estimated to cost less than the equivalent of \$2,000,000 may be awarded on the basis of local competitive bidding among prequalified contractors in accordance with procedures acceptable to the ADB.</p>	Schedule 3, para. 6	Complied with.
<p>Each supply contract for equipment or materials estimated to cost less than the equivalent of \$500,000 (other than minor items) shall be awarded on the basis of International Shopping (IS) as described in Chapter III of the <i>Guidelines for Procurement</i>.</p>	Schedule 3, para. 7	<p>Complied with. Bulk procurement of pipes for the small subprojects was carried out through IS for the first nine contract packages. International competitive bidding (ICB) was carried out for contract packages 10 to 15, and advertised in the ADB <i>Business Opportunities</i> website for bidding to be more competitive by inviting foreign bidders. However, no bid was received from foreign bidders, while the number of local bidders decreased because of the stringent qualification criteria of ICB, especially on financial qualification.</p>
<p>The borrower shall establish, immediately after the effective date, an imprest account at <i>Bangko Sentral ng Pilipinas</i>, or a designated state-owned financial institution, to expedite disbursements of the loan proceeds. These payments shall be in local currency for eligible expenditures incurred under the Project. The imprest account shall be established, managed, replenished and liquidated in accordance with the ADB's "<i>Guidelines on Imprest Fund and Statement of Expenditures Procedures</i>, as amended from time to time, and detailed arrangements agreed upon between the borrower and the ADB. The initial amount to be deposited into the imprest account from the loan shall not exceed an amount equivalent to \$2,000,000. The individual payment that may be reimbursed or liquidated under the statement of expenditures procedure shall be less than \$100,000 equivalent for each item of expenditure.</p>	Schedule 3, para. 15 (a) and (b)	<p>Complied with. An imprest account was established in March 2000, with a maximum initial deposit of \$2.0 million, which was fully liquidated.</p>



Covenant	Reference in Loan Agreement	Status of Compliance
<p>No withdrawals will be made from the loan account for a subproject until (i) the WD concerned is established and has been issued a conditional certificate of conformance by the borrower; (ii) a legally binding and operative subsidiary loan agreement has been executed on behalf of the borrower and the WD concerned on terms and conditions acceptable to the ADB; (iii) the subproject is determined to be financially viable, with a minimum financial internal rate of return of 11%; and (iv) the WD concerned has taken all necessary steps to (a) acquire the required land, rights in land and water, and rights-of-way to carry out expeditious implementation of the subproject; and (b) obtain all required permits in connection therewith.</p>	Schedule 3, para. 17	Complied with.
<p>The services of consultants shall be utilized in the carrying out of the Project, particularly with regard to (i) preparation and review of socioeconomic and technical surveys, (ii) development of standard water supply designs, (iii) preparation of detailed Subproject designs and tender documentation, (iv) supervision of subprojects construction and evaluation of project activities, (v) capacity building of WDs in order to improve capabilities in (a) reduction of nonrevenue water, (b) financial and engineering planning, (c) computerized accounting, billing, collection and management information systems, and (d) overall management; and (e) supporting project management and monitoring.</p>	Schedule 4, para. 1	Complied with. The contract for consulting services was awarded to an association of foreign and local firms.
<p>The borrower shall have overall responsibility for project implementation. The borrower shall assist the WDs in design and implementation of subprojects under Part A and shall coordinate with the water districts concerned to implement Part B(b) of the Project. The Department of Health (DOH) shall assist the borrower in the implementation of Part B(a) relating to health and hygiene education program.</p>	Schedule 5, para. 1 (a)	Complied with. However, assistance from DOH was not requested since this Project component was eventually cancelled.

Covenants	Reference In Loan Agreement	Status of Compliance
<p>The project management office (PMO), established under Loan No. 1269-PHI: Municipal Water Supply Project, shall be responsible for the overall coordination, supervision and monitoring of the Project, staffed and assisted by qualified and experienced staff of the borrower and by the consultants referred to in Schedule 4. The guarantor shall also establish an inter-agency technical committee (IATC) to review and approve subprojects. The IATC shall be chaired by the borrower and shall consist of members from the National Economic and Development Authority, the Department of the Interior and Local Government, and the Department of Finance.</p>	Schedule 5, para. 1 (b)	<p>Complied with.</p> <p>Until mid-2001, the PMO experienced difficulties because of the fast turnover of project managers, project team leaders at the consultant, and insufficient coordination with the subprojects' area managers. In October 2001 after a new LWUA administrator assumed office, the PMO was reorganized by appointing a full-time project director, assisted by two full-time project managers, each being responsible for large and medium-sized subprojects and small subprojects. The project consultants continued to support the PMO.</p>
<p>The borrower shall cause one or more WDs to establish, singly or jointly, project field implementation units (FIUs) to implement the relevant subprojects' activities. Each FIU, which may include more than one WD, shall be headed by a resident consultant engineer (RE) and shall be staffed by qualified and experienced employees of the WDs concerned.</p>	Schedule 5, para. 2	<p>Complied with. Resident engineers (RE) from the consultant for large and medium-sized subprojects were sometimes replaced by LWUA staff because of lack of consultant's budget, when the project closing date was extended.</p>
<p>With assistance of the consultants, the borrower shall select or propose substitution of, subprojects for subsequent appraisal in accordance with the agreed criteria.</p>	Schedule 5, para. 3	<p>Complied with. A total of 222 subprojects (22 large or medium-sized and 109 small) were identified, and 109 (19 large or medium-sized and 90 small) were approved by IATC.</p>
<p>Upon selection, the borrower shall submit to ADB an application for approval of large subprojects and the initial two medium and small subprojects. For all other medium and small subprojects, submit to the IATC for approval.</p>	Schedule 5, para. 4	<p>Complied with. Small subprojects were submitted in "packages" of 2 to 5 subprojects to speed up IATC examination and approval.</p>
<p>The borrower shall finance 90% of the total cost of each subproject and such financing, including the proceeds of the loan, shall be provided in the form of a loan to the WD concerned evidenced by execution of a subsidiary loan agreement on terms and conditions satisfactory to ADB. The remaining 10% of the total cost of each subproject shall be funded through equity contributions made by the WD, in the form of cash or in kind, or both, in such proportions as the borrower and the WD concerned may agree.</p>	Schedule 5, para. 5	<p>Complied with. Some water districts increased their equity contributions above 10%, or through advance implementation.</p>

Covenants	Reference In Loan Agreement	Status of Compliance
The borrower shall ensure that an effective loan collection system is fully operational and implemented, within 12 months from the effective date, which shall allow the borrower to maintain ongoing loan collections at not less than 85% recovery by the year 2000, for all loans which are outstanding and payable by the WDs to the borrower.	Schedule 5, para. 9	Complied with. Actual collection efficiency averaged 89%. The maximum was 100% and the minimum of 47%. Data refer only to 36 completed subprojects, with less than a year of operation.
The borrower shall ensure that the WDs take appropriate measures to (i) effect proper collection of outstanding water bills; (ii) protect their water resources and facilities through vigorous prosecution for violations such as water meter tampering or water theft; and (iii) effect reduction of nonrevenue water (NRW) in each WD under the Project so that, by the year 2001 and year 2005, such NRW shall not exceed 30% and 25%, respectively, of the total water revenue generated by such WD.	Schedule 5, para. 10	Complied with. Average NRW is 26%.
The borrower shall ensure that each WD increases the supply of water, to the people residing in the area below the poverty levels established by the Guarantor by initiating or expanding the public standpipes program of each WD.	Schedule 5, para. 11	Not complied with. The expansion of the public stand pipe program to people below the poverty level areas was often overlooked by water districts during project implementation,
The borrower shall ensure that (i) concerned nongovernment organizations (NGO) are properly associated with WDs and involved at all stages of subproject planning, operations and maintenance and actively assist in the capacity building, health and hygiene and benefit monitoring and evaluation components of the project; (ii) women's community groups participate in all relevant project-related decision making activities; and (iii) adequate opportunities for employment of women in WDs and for related activities under the Project are made available, including at least one women's group representative at all times on each WD board of directors.	Schedule 5, para. 12	Partially complied with. No NGOs have been associated with the water districts. Employment opportunities are provided to women. This is illustrated by the active involvement of women in water district management at all levels, up to and including general manager.
The borrower shall ensure that the subprojects are designed and implemented, and the subproject facilities operated and maintained, in strict conformity with the guarantor's national environmental impact standards concerning disposal of solid, liquid and gaseous waste.	Schedule 5, para. 13	Complied with. Environmental compliance certificate or certificate of non-coverage was obtained.

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<b>Covenants</b>	<b>Reference In Loan Agreement</b>	<b>Status of Compliance</b>
The borrower shall ensure that the implementation of the Project, the benefits resulting from the Project, and the overall operations of each WD are monitored and evaluated on an annual basis. Within 6 months of the effective date, the borrower shall further refine the Benefit Monitoring and Evaluation (BME) program, in a manner satisfactory to the ADB, containing relevant financing and technical information.	Schedule 5, para. 14	Partially complied with. A BME program had been prepared under previous Bank-assisted projects. Refinement was not carried out and it was decided to include the BME in the project performance monitoring system (PPMS). This PPMS was operational at project completion.

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## FINANCIAL AND ECONOMIC EVALUATION

1. For the Project completion review (PCR), nine subprojects were subjected to economic and financial evaluation to determine their continued viability.<sup>1</sup> The subprojects were mainly those that had been evaluated during the appraisal or midterm review. Additional water districts within the vicinity of the visited water districts were included. Viability was established by computing for economic and financial internal rates of return and net present values following the Asian Development Bank's (ADB) *Guidelines for the Economic Analysis of Water Supply Projects* and *Guidelines for the Financial Governance and Management of Investment Projects Financed by the Asian Development Bank*.

### A. Financial Analysis

2. Financial reevaluations were conducted for all nine sample subprojects. Financial evaluations were conducted by calculating for financial internal rates of return (FIRR) and net present values (NPV). Costs and revenues were evaluated using "with- and without-subproject" scenarios at constant 2003 prices.

3. Evaluations were based on the following assumptions: investment costs include those for the rehabilitation and expansion of existing water supply systems and the construction of new systems. These include land, new treatment plant, pumping and distribution facilities, and new connections. Capital costs were computed based on the actual disbursements for the subproject. Operating costs cover the incremental labor, power, chemicals, repairs and maintenance, and administrative costs projected over 25 years.

4. The Local Water Utilities Administration (LWUA) imposes a graduated interest rate structure based on the total debt water districts have secured from the LWUA.<sup>2</sup> The weighted average cost of capital (WACC) was computed based on these parameters and the resulting WACC ranges from 10.6% to 15.1% for the nine subprojects.

5. Actual water tariffs to 2006 and the water district's projected tariff increases from 2007 onwards were used as the basis for projecting revenues for the subprojects. Under the LWUA's guidelines, the proportion of household income used to pay for water should not exceed 5% and increases in water rates should be limited to a maximum of 60% per year.<sup>3</sup> For the nine subprojects, the average water rate increases for the subprojects vary from 10% to 40%, to be implemented every 2 years. Other inputs to the financial analysis include nonrevenue water (NRW) and collection efficiency. The increases were assumed so that revenues are sufficient to cover all financial requirements of the water districts.

### 1. Financial Internal Rates of Return

6. The major indicators of financial viability are summarized in Table 1. All the nine subprojects were found to be still financially viable, with FIRRs ranging from 17% to 32%. These are all above the computed WACC. However, the recalculated FIRRs are lower than those calculated during previous evaluations at appraisal, updating, and the midterm review. In

<sup>1</sup> Subprojects that were reevaluated include Banga, Binmaley, Bogo, Digos, Dumangas, Guimba, Samal, San Joaquin, and Umingan.

<sup>2</sup> LWUA imposes a graduated interest rate structure based on the total debt water districts have secured from LWUA. The interest rates are as follows: (i) 8.5% on the first P2.0 million, (ii) 10.5% on the portion of debt between P2.0 million and P5.0 million, and (iii) 12.5% on the portion of debt in excess of P5.0 million.

<sup>3</sup> LWUA. 1004. *Manual on Water Rates and Related Practices*. Manila.

Banga, San Joaquin, and Umingan, the proposed water rate increases will be higher than those proposed in the appraisal reports of these subprojects. Banga, for example, will increase its rate in 2006 by 45%, rather than the 30% proposed in its appraisal report.

7. The financial reevaluations were further subjected to sensitivity analyses using the following parameters: (1) 10% increase in capital costs, (ii) 10% increase in operation and maintenance (O&M), and (iii) 10% decrease in revenues. All subprojects were evaluated to be within acceptable ranges of sensitivity under adverse circumstances.

8. Summary results of the reevaluations are presented in Table A8.1.

**Table A8.1: Summary Results of Financial Evaluation**

Item	Financial Internal Rate of Return (%)							
	Project Appraisal (1996)	Updated (1998–2001)	Midterm Review (2001)	Project Completion Review (2006)				
				WACC	FIRR	Sensitivity Analyses		
						Cost +10%	O&M +10%	Revenue -10%
Banga	18	24		12	14	13	13	12
Binmaley		23		12	23	21	20	19
Umingan		25		11	18	16	17	16
Guimba		19	29	13	26	24	25	23
Dumangas		25		12	21	20	19	18
Bogo		35	35	13	32	27	29	24
San Joaquin				12	17	15	15	14
Digos				15	32	31	32	29
Samal				11	27	25	26	23

FIRR = financial internal rate of return, O&M = operation and maintenance, WACC = weighted average cost of capital. Source: Asian Development Bank.

## 2. Affordability Analysis

9. An affordability analysis of water rates in relation to household income was conducted to ensure that the proposed water charges did not go beyond the prescribed limit of 5% of monthly household income.<sup>4</sup> The projection used 2003 income levels and annual results were analyzed to ensure that the projected tariffs would not exceed the 5% limit. Currently, all the subprojects are within the limit, with San Joaquin having the highest percentage at 4.4%. Banga is expected to reach the highest allowable percentage of 4.9 by 2012 and Umingan by 2011 (Table A8.2).

<sup>4</sup> The rates must be kept affordable to low income group (LIG). The LIG is defined as that sector of residential consumers having the lowest capability to pay for water service. It has been ascertained that a water consumption of 10 m<sup>3</sup> per month will provide for the basic requirements of those in the LIG. For this purpose, the minimum charge for residential connections should not exceed 5% of the average income of the LIG in the service area.

**Table A8.2: Affordability Analyses of Water Charges**

Item	2005			Projection (2006–2013)	
	Ave. Monthly Income of LIG (P/month) <sup>a</sup>	Min. Water Charge (P/10 m <sup>3</sup> )	MWC as to Income (%)	Maximum Percentage (%)	Year
Banga	6,827	150.0	2.4	4.9	2012
Binmaley	6,930	149.0	2.4	2.6	2007
Bogo	5,707	117.0	2.3	3.3	2012
Digos	6,894	184.0	2.9	3.5	2009
Dumangas	7,007	218.0	3.4	4.8	2013
Guimba	7,805	187.0	2.6	3.1	2007
Samal	6,894	156.0	2.5	2.5	2009
San Joaquin	7,007	280.0	4.4	4.4	2007/2011
Umingan	6,930	240.0	3.8	4.9	2011

LIG = low income group, MWC = minimum water charge.

<sup>a</sup> Data from NSCB, Annual Poverty Thresholds by Province, 2003–2004, inflated annually by 5%.

Sources: Asian Development Bank and Water Districts.

### 3. Full Cost Recovery

10. In line with the Government's policy of discouraging Government subsidies and to encourage a corporate approach to the management of public service enterprises, water tariff rates are set at levels that would enable water districts to recover capital costs and service their debt while providing enough funds for O&M costs and future expansion. The recovery of capital costs will ensure funds are available for asset replacement after the life of the Project. Several indicators were analyzed to provide a basis for evaluating the profitability of the water districts' operations. These include NRW, collection efficiency, and debt–service ratio.

11. The Project aims to decrease NRW to at least 25% after subproject completion. By 2005, most of the water districts reported a NRW of less than 25% except for Banga (29%) and Umingan (38%). The high NRW of Umingan is reportedly due to the existence of old distribution lines from the existing system prior to subproject implementation.

12. Collection efficiency for all subprojects was very efficient (94%–97%). This includes year-to-date collection of all current accounts as against current billings. The collection efficiency target during appraisal was generally set at 95%.

13. The debt–service ratio (DSR) measures the extent to which forecast cash flows are able to cover forecast debt service requirements.<sup>5</sup> The LWUA requires a DSR of 1.3. Currently, Banga is being closely watched by the LWUA and is reportedly scheduled for intervention (which would mean a take-over of its operation and management by the LWUA). Table A8.3 shows the performance of the nine subprojects on the three indicators.

<sup>5</sup> A performance of 1 means that there is precise coverage, while a performance in excess of 1 indicates a margin of safety in covering debt, plus yielding surplus funds for investment, etc.

**Table A8.3: Sustainability Indicators**

<b>Item</b>	<b>NRW</b> (% in 2005)	<b>Collection Efficiency</b> (% in 2005)	<b>Debt–Service Ratio</b> (minimum)
Banga	29	97	0.48
Binmaley	10	97	1.32
Umingan	38	96	1.36
Guimba	18	95	1.12
Dumangas	21	95	1.01
Bogo	9	99	1.30
San Joaquin	19	95	1.52
Digos	22	94	1.79
Samal	22	96	1.43

NRW = nonrevenue water.

Sources: Asian Development Bank and Water Districts.

## **B. Economic Analysis**

### **1. Assumptions and Methodology**

14. Calculations were based on 2003 constant prices. Economic costs comprised civil works, equipment, land costs, and O&M costs during the 25-year economic life of the subproject. The same capital and O&M expenditures used in the financial analysis were used with adjustments such as: (i) exclusion of taxes, duties, and subsidies; (ii) application of a shadow price of 0.6 to market price of unskilled domestic labor to reflect the underemployment of unskilled labor in the country, while skilled labor was given a shadow price of 1.0; and (iii) use of a shadow exchange rate factor of 1.2 for the foreign cost component. Annual O&M costs are in constant terms, and yearly escalations represent only incremental O&M costs of increased water production.

15. Benefit streams include revenues derived from the collection of increased water tariff, which were considered as a proxy valuation of the benefits derived from the improved water supply. The benefit was equivalent to the willingness to pay for an improved water supply, as reflected in the water tariffs and connection fees. The financial price of water was first de-escalated by removing the effects of inflation. The resulting value was multiplied by a factor of 1.2 to derive the economic value of water. It was also envisaged that the subproject would also increase the amount of water being used per capita, because a properly functioning piped water system would provide higher water volumes at higher pressure and would be more convenient than an outside point source such as a shallow well.

16. Health benefits were identified, quantified and valued. Morbidity and mortality due to water-borne diseases are significant in the subproject areas and formed part of the evaluation, which included beneficiaries' savings due to reductions in medical expenses for treating waterborne diseases and reductions in productivity lost due to illness or death caused by these diseases. To derive the value of health benefits, several factors were considered: (i) immediate population served by the subproject, (ii) labor force participation rate in the area, (iii) morbidity and mortality rate for waterborne diseases, (iv) average number of days sick per incidence, (v) minimum daily wage rate in the subproject area, and (vi) an assumption that about 20% of the total benefits are attributable to the subproject.

17. Savings in fire damages because of the provision of fire hydrants in the service area were also evaluated. To derive the value of the benefits, the following factors were considered: (i) population in the service area, (ii) number of houses or structures in the area, (iii) average



replacement value of the structures, and (iv) the assumption that about 0.75% of the total computed benefits would be derived with the implementation of the subproject.

## 2. Economic Internal Rates of Return

18. The major indicators of economic viability for the nine subprojects are summarized in Table A8.4. Following ADB guidelines, the economic opportunity cost of capital (EOCC) was set at 12%. The evaluation showed that all the subprojects were economically viable. EIRRs were computed to be over the EOCC and ranged from about 13% to 34%. Like the financial reevaluation, for those subprojects that had been previously evaluated the results were lower than earlier projections (with the exception of Dumangas, which was marginally higher).

19. Two scenarios for the conduct of sensitivity analyses were looked into. The parameters included the following (i) a 10% increase in costs, and (ii) a 10% decrease in benefits. Banga, Dumangas and Guimbas, had marginal results, but the other six subprojects were evaluated to be within acceptable ranges of sensitivity under adverse circumstances.

**Table A8.4: Summary Results of Economic Reevaluation**

Item	Economic Internal Rate of Return (%)					
	Project Appraisal (1996)	Updated (1998–2001)	Midterm Review (2001)	Project Completion Review (2006)		
				EIRR	Sensitivity Analyses	
				Rev -10%	Cost +10%	
Banga	32	25		13	11	11
Binmaley		24		21	15	16
Umingan		31		16	12	12
Guimba		31	32	12	9	10
Dumangas		23		24	8	10
Bogo		39	39	26	21	22
San Joaquin				25	22	22
Digos				26	17	18
Samal				36	26	27

FIRR = economic internal rate of return, O&M = operations and maintenance, Rev = revenues.

Sources: Asian Development Bank.

**Table A8.5: Financial Internal Rate of Return  
Banga Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues			
	Incremental		Project		Incremental		Project		Incremental		Project		Incremental		Project	
	Revenues	Costs	Cost	Net	Revenues	Costs	Cost	Net	Revenues	Costs	Cost	Net	Revenues	Costs	Cost	Net
2003			18,081	(18,081)			19,889	(19,889)			18081	(18,081)			18,081	(18,081)
2004	1,203	1,313	580	(690)	1,203	1,313	638	(748)	1,203	1,444	580	(821)	1,083	1,313	580	(810)
2005	1,494	1,654	197	(357)	1,494	1,654	216	(376)	1,494	1,819	197	(522)	1,345	1,654	197	(506)
2006	2,286	1,737	15	535	2,286	1,737	17	533	2,286	1,910	15	361	2,058	1,737	15	306
2007	2,515	1,824	16	675	2,515	1,824	18	674	2,515	2,006	16	493	2,264	1,824	16	424
2008	3,458	1,915	17	1,526	3,458	1,915	19	1,524	3,458	2,106	17	1,335	3,112	1,915	17	1,180
2009	3,804	2,010	19	1,775	3,804	2,010	20	1,773	3,804	2,211	19	1,574	3,424	2,010	19	1,395
2010	5,231	2,111	20	3,100	5,231	2,111	22	3,098	5,231	2,322	20	2,889	4,708	2,111	20	2,577
2011	5,754	2,217	21	3,516	5,754	2,217	23	3,514	5,754	2,438	21	3,294	5,178	2,217	21	2,941
2012	7,911	2,327		5,584	7,911	2,327		5,584	7,911	2,560		5,351	7,120	2,327		4,793
2013	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2014	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2015	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2016	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2017	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2018	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2019	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2020	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2021	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2022	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2023	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2024	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2025	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2026	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
2027	8,702	2,444		6,259	8,702	2,444		6,259	8,702	2,688		6,014	7,832	2,444		5,388
<b>FIRR (%)</b>				<b>13.70</b>				<b>12.81</b>				<b>13.00</b>				<b>11.99</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.6: Financial Internal Rate of Return  
Binmaley Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues			
	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net
	Revenues	Costs			Revenues	Costs			Revenues	Costs			Revenues	Costs		
2003	5,278	4,600	31,941	(31,263)	5,278	4,600	35,135	(34,457)	5,278	5,060	31,941	(31,723)	4,750	4,600	31,941	(31,791)
2004	6,181	5,117	761	304	6,181	5,117	837	227	6,181	5,629	761	(208)	5,563	5,117	761	(315)
2005	9,397	8,270	572	555	9,397	8,270	629	498	9,397	9,097	572	(272)	8,457	8,270	572	(385)
2006	11,215	9,129	191	1,895	11,215	9,129	211	1,876	11,215	10,042	191	982	10,094	9,129	191	773
2007	17,887	10,031	205	7,651	17,887	10,031	225	7,630	17,887	11,034	205	6,648	16,098	10,031	205	5,862
2008	19,230	10,978	219	8,033	19,230	10,978	241	8,011	19,230	12,076	219	6,935	17,307	10,978	219	6,110
2009	24,257	20,885	234	3,139	24,257	20,885	257	3,115	24,257	22,973	234	1,050	21,832	20,885	234	713
2010	25,855	13,017	250	12,588	25,855	13,017	275	12,563	25,855	14,319	250	11,287	23,270	13,017	250	10,003
2011	31,837	14,114	267	17,457	31,837	14,114	294	17,430	31,837	15,525	267	16,045	28,653	14,114	267	14,273
2012	33,738	15,265		18,473	33,738	15,265		18,473	33,738	16,791		16,947	30,364	15,265		15,099
2013	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2014	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2015	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2016	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2017	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2018	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2019	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2020	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2021	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2022	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2023	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2024	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2025	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2026	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
2027	35,715	16,474		19,241	35,715	16,474		19,241	35,715	18,121		17,594	32,144	16,474		15,670
<b>FIRR (%)</b>				<b>22.58</b>				<b>21.26</b>				<b>20.34</b>				<b>18.82</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.7: Financial Internal Rate of Return  
Bogo Water District**

Year	Base Hypothesis				20% Increase in Project Cost				20% Increase in O & M				20% Decrease in Revenues				
	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	
	Revenues	Costs			Revenues	Costs			Revenues	Costs			Revenues	Costs			
2003	3,615	631	26,100	(23,116)	3,615	631	31,320	(28,336)	3,615	757	26,100	(23,242)	2,892	631	26,100	(23,839)	
2004	5,852	631	156	5,065	5,852	631	187	5,034	5,852	757	156	4,939	4,682	631	156	3,895	
2005	7,316	1,738	463	5,115	7,316	1,738	555	5,023	7,316	2,086	463	4,768	5,853	1,738	463	3,652	
2006	6,962	2,534	75	4,353	6,962	2,534	90	4,338	6,962	3,041	75	3,846	5,570	2,534	75	2,960	
2007	8,011	3,445	84	4,482	8,011	3,445	101	4,465	8,011	4,133	84	3,793	6,409	3,445	84	2,880	
2008	11,702	4,487	95	7,121	11,702	4,487	113	7,102	11,702	5,384	95	6,224	9,362	4,487	95	4,780	
2009	13,225	5,680	106	7,439	13,225	5,680	127	7,418	13,225	6,816	106	6,303	10,580	5,680	106	4,794	
2010	18,585	7,047	119	11,419	18,585	7,047	142	11,395	18,585	8,457	119	10,010	14,868	7,047	119	7,702	
2011	20,796	8,613	133	12,050	20,796	8,613	0	12,183	20,796	10,336	133	10,327	16,637	8,613	133	7,891	
2012	28,578	10,408		18,171	28,578	10,408		18,171	28,578	12,490		16,089	22,863	10,408		12,455	
2013	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2014	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2015	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2016	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2017	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2018	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2019	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2020	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2021	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2022	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2023	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2024	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2025	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2026	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
2027	31,789	12,465		19,323	31,789	12,465		19,323	31,789	14,959		16,830	25,431	12,465		12,966	
<b>FIRR (%)</b>				<b>31.56</b>				<b>27.41</b>					<b>29.10</b>				<b>23.86</b>

( ) = negative, FIRR = financial internal rate of return, O&M =operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.8: Financial Internal Rate of Return  
Digos Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues				
	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	
	Revenues	Costs			Revenues	Costs			Revenues	Costs			Revenues	Costs			
2003	2,308		66,306	(63,998)	2,308		72,937	(70,629)	2,308		66,306	(63,998)	2,077		66,306	(64,229)	
2004	3,122	(8,224)	736	10,610	3,122	(8,224)	809	10,537	3,122	(9,046)	736	11,433	2,810	(8,224)	736	10,298	
2005	18,487	12,103	744	5,640	18,487	12,103	818	5,566	18,487	13,313	744	4,430	16,638	12,103	744	3,791	
2006	20,761	12,988	317	7,457	20,761	12,988	348	7,425	20,761	14,286	317	6,158	18,685	12,988	317	5,381	
2007	32,727	13,890	338	18,499	32,727	13,890	372	18,465	32,727	15,279	338	17,110	29,454	13,890	338	15,226	
2008	35,676	14,810	362	20,504	35,676	14,810	398	20,468	35,676	16,291	362	19,023	32,108	14,810	362	16,937	
2009	54,692	15,749	387	38,556	54,692	15,749	425	38,518	54,692	17,324	387	36,982	49,223	15,749	387	33,087	
2010	58,519	16,706	413	41,400	58,519	16,706	454	41,359	58,519	18,377	413	39,729	52,667	16,706	413	35,548	
2011	72,850	17,683	442	54,726	72,850	17,683	486	54,682	72,850	19,451	442	52,958	65,565	17,683	442	47,441	
2012	77,404	18,679		58,725	77,404	18,679		58,725	77,404	20,547		56,858	69,664	18,679		50,985	
2013	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2014	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2015	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2016	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2017	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2018	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2019	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2020	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2021	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2022	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2023	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2024	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2025	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2026	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
2027	82,141	19,695		62,446	82,141	19,695		62,446	82,141	21,664		60,476	73,927	19,695		54,232	
<b>FIRR (%)</b>				<b>32.44</b>				<b>30.55</b>					<b>31.60</b>				<b>29.48</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.9: Financial Internal Rate of Return  
Dumangas Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues				
	Incremental		Project	Net	Incremental		Project	Net	Incremental		Project	Net	Incremental		Project	Net	
	Revenues	Costs	Cost		Revenues	Costs	Cost		Revenues	Costs	Cost		Revenues	Costs	Cost		Revenues
2003			17,037	(17,037)			18,741	(18,741)			17,037	(17,037)			17,037	(17,037)	
2004	2,395	1,474	(379)	1,300	2,395	1,474	(417)	1,338	2,395	1,621	(379)	1,153	2,156	1,474	(379)	1,061	
2005	5,050	2,400	1,127	1,523	5,050	2,400	1,239	1,411	5,050	2,640	1,127	1,283	4,545	2,400	1,127	1,018	
2006	350	3,039	116	(2,804)	350	3,039	128	(2,816)	350	3,342	116	(3,108)	315	3,039	116	(2,839)	
2007	3,909	3,709	124	76	3,909	3,709	137	64	3,909	4,080	124	(295)	3,518	3,709	124	(315)	
2008	4,298	4,413	133	(247)	4,298	4,413	146	(261)	4,298	4,854	133	(689)	3,869	4,413	133	(677)	
2009	8,742	5,152	142	3,448	8,742	5,152	156	3,433	8,742	5,667	142	2,932	7,868	5,152	142	2,573	
2010	9,227	5,928	152	3,147	9,227	5,928	167	3,132	9,227	6,521	152	2,554	8,305	5,928	152	2,225	
2011	14,775	6,743	162	7,869	14,775	6,743	178	7,853	14,775	7,418	162	7,195	13,297	6,743	162	6,392	
2012	15,381	7,599		7,782	15,381	7,599		7,782	15,381	8,359		7,022	13,843	7,599		6,244	
2013	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2014	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2015	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2016	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2017	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2018	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2019	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2020	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2021	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2022	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2023	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2024	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2025	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2026	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
2027	22,307	8,498		13,809	22,307	8,498		13,809	22,307	9,347		12,960	20,076	8,498		11,579	
<b>FIRR (%)</b>				<b>20.77</b>				<b>19.74</b>								<b>19.45</b>	<b>18.25</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.10: Financial Internal Rate of Return  
Guimba Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues			
	Incremental Revenues	Costs	Project Cost	Net	Incremental Revenues	Costs	Project Cost	Net	Incremental Revenues	Costs	Project Cost	Net	Incremental Revenues	Costs	Project Cost	Net
2003			48,557	(48,557)			53,413	(53,413)			48,557	(48,557)			48,557	(48,557)
2004	11,227	7,297	777	3,153	11,227	7,297	854	3,076	11,227	8,027	777	2,424	10,104	7,297	777	2,031
2005	14,175	7,981	593	5,601	14,175	7,981	653	5,541	14,175	8,779	593	4,803	12,758	7,981	593	4,183
2006	19,496	8,380	442	10,673	19,496	8,380	486	10,629	19,496	9,218	442	9,835	17,546	8,380	442	8,724
2007	23,195	8,799	255	14,141	23,195	8,799	281	14,115	23,195	9,679	255	13,261	20,876	8,799	255	11,821
2008	24,123	9,239	282	14,602	24,123	9,239	310	14,574	24,123	10,163	282	13,679	21,711	9,239	282	12,190
2009	27,597	9,701	310	17,585	27,597	9,701	341	17,554	27,597	10,671	310	16,615	24,837	9,701	310	14,826
2010	28,701	10,186	342	18,172	28,701	10,186	376	18,138	28,701	11,205	342	17,154	25,830	10,186	342	15,302
2011	32,833	10,695	377	21,761	32,833	10,695	415	21,723	32,833	11,765	377	20,691	29,550	10,695	377	18,478
2012	34,147	11,230		22,917	34,147	11,230		22,917	34,147	12,353		21,794	30,732	11,230		19,502
2013	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2014	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2015	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2016	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2017	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2018	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2019	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2020	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2021	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2022	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2023	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2024	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2025	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2026	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
2027	39,064	11,792		27,272	39,064	11,792		27,272	39,064	12,971		26,093	35,158	11,792		23,366
<b>FIRR (%)</b>				<b>26.00</b>				<b>24.30</b>				<b>24.75</b>				<b>22.85</b>

(-) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.  
Source: Local Water Utilities Administration.

**Table A8.11: Financial Internal Rate of Return  
Samal Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues			
	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net
	Revenues	Costs			Revenues	Costs			Revenues	Costs			Revenues	Costs		
2003			7,460	(7,460)			8,206	(8,206)			7,460	(7,460)			7,460	(7,460)
2004	2,600	653	-	1,947	2,600	653	0	1,947	2,600	718	0	1,881	2,340	653	0	1,687
2005	3,387	1,278	401	1,708	3,387	1,278	441	1,668	3,387	1,405	401	1,580	3,048	1,278	401	1,369
2006	3,168	1,401	75	1,692	3,168	1,401	82	1,684	3,168	1,541	75	1,552	2,851	1,401	75	1,375
2007	3,568	1,531	80	1,956	3,568	1,531	88	1,948	3,568	1,685	80	1,803	3,211	1,531	80	1,600
2008	3,654	1,668	86	1,899	3,654	1,668	95	1,891	3,654	1,835	86	1,733	3,288	1,668	86	1,534
2009	4,116	1,811	93	2,211	4,116	1,811	102	2,202	4,116	1,992	93	2,030	3,704	1,811	93	1,800
2010	4,215	1,962	100	2,153	4,215	1,962	110	2,143	4,215	2,158	100	1,957	3,793	1,962	100	1,731
2011	4,747	2,120	107	2,520	4,747	2,120	118	2,509	4,747	2,332	107	2,308	4,273	2,120	107	2,045
2012	4,861	2,286		2,575	4,861	2,286		2,575	4,861	2,514		2,347	4,375	2,286		2,089
2013	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2014	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2015	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2016	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2017	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2018	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2019	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2020	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2021	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2022	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2023	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2024	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2025	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2026	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
2027	5,476	2,460		3,015	5,476	2,460		3,015	5,476	2,706		2,769	4,928	2,460		2,468
<b>FIRR (%)</b>				<b>27.48</b>				<b>25.14</b>				<b>25.71</b>				<b>23.08</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.



**Table A8.12: Financial Internal Rate of Return  
San Joaquin Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues			
	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net	Incremental		Project Cost	Net
	Revenues	Costs			Revenues	Costs			Revenues	Costs			Revenues	Costs		
2003							0				0					
2004			10,086	(10,086)			11,094	(11,094)			10,086	(10,086)			10,086	(10,086)
2005	1,841	1,308	489	44	1,841	1,308	538	(5)	1,841	1,439	489	(87)	1,657	1,308	489	(140)
2006	2,815	1,373	10	1,431	2,815	1,373	11	1,430	2,815	1,511	10	1,294	2,534	1,373	10	1,150
2007	3,158	1,442	11	1,705	3,158	1,442	12	1,704	3,158	1,586	11	1,561	2,843	1,442	11	1,390
2008	3,222	1,514	12	1,696	3,222	1,514	13	1,695	3,222	1,666	12	1,544	2,899	1,514	12	1,374
2009	3,615	1,590	13	2,012	3,615	1,590	14	2,011	3,615	1,749	13	1,853	3,253	1,590	13	1,651
2010	3,687	1,669	14	2,004	3,687	1,669	15	2,003	3,687	1,836	14	1,837	3,318	1,669	14	1,635
2011	4,137	1,753	14	2,369	4,137	1,753	16	2,368	4,137	1,928	14	2,194	3,723	1,753	14	1,956
2012	4,220	1,840		2,379	4,220	1,840		2,379	4,220	2,025		2,195	3,798	1,840		1,957
2013	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2014	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2015	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2016	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2017	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2018	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2019	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2020	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2021	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2022	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2023	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2024	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2025	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2026	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
2027	4,304	1,933		2,371	4,304	1,933		2,371	4,304	2,126		2,178	3,874	1,933		1,941
<b>FIRR (%)</b>				<b>16.60</b>				<b>15.17</b>				<b>15.20</b>				<b>13.58</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.13: Financial Internal Rate of Return  
Umingan Water District**

Year	Base Hypothesis				10% Increase in Project Cost				10% Increase in O & M				10% Decrease in Revenues			
	Incremental		Project	Net	Incremental		Project	Net	Incremental		Project	Net	Incremental		Project	Net
	Revenues	Costs	Cost		Revenues	Costs	Cost		Revenues	Costs	Cost		Revenues	Costs	Cost	
2003	1,986	536	8,279	(6,829)	1,986	536	9,107	(7,657)	1,986	590	8,279	(6,883)	1,787	536	8,279	(7,028)
2004	1,587	637	76	874	1,587	637	84	866	1,587	701	76	810	1,428	637	76	715
2005	2,425	1,046	83	1,296	2,425	1,046	91	1,288	2,425	1,151	83	1,191	2,183	1,046	83	1,053
2006	2,573	1,218	67	1,288	2,573	1,218	74	1,281	2,573	1,340	67	1,166	2,315	1,218	67	1,030
2007	3,829	1,399	72	2,357	3,829	1,399	80	2,350	3,829	1,539	72	2,217	3,446	1,399	72	1,974
2008	4,026	1,589	78	2,359	4,026	1,589	86	2,351	4,026	1,748	78	2,200	3,624	1,589	78	1,956
2009	5,625	1,789	85	3,752	5,625	1,789	93	3,744	5,625	1,967	85	3,573	5,063	1,789	85	3,190
2010	5,877	1,998	92	3,787	5,877	1,998	101	3,778	5,877	2,198	92	3,587	5,289	1,998	92	3,199
2011	7,913	2,218	99	5,596	7,913	2,218	109	5,586	7,913	2,440	99	5,374	7,121	2,218	99	4,804
2012	8,233	2,449		5,784	8,233	2,449		5,784	8,233	2,694		5,539	7,409	2,449		4,960
2013	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2014	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2015	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2016	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2017	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2018	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2019	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2020	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2021	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2022	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2023	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2024	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2025	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2026	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
2027	8,562	2,691		5,871	8,562	2,691		5,871	8,562	2,960		5,602	7,706	2,691		5,014
<b>FIRR (%)</b>				<b>18.16</b>				<b>16.28</b>				<b>17.45</b>				<b>16.01</b>

( ) = negative, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Local Water Utilities Administration.

**Table A8.14: Economic Internal Rate of Return and Sensitivity Analyses  
Banga Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2003	0	9,615	(9,615)	0	9,615	(9,615)	0	10,577	(10,577)
2004	971	10,886	(9,915)	874	10,886	(10,012)	971	11,974	(11,003)
2005	1,647	1,600	47	1,483	1,600	(117)	1,647	1,760	(113)
2006	2,301	1,680	621	2,071	1,680	391	2,301	1,848	453
2007	2,381	1,764	617	2,143	1,764	379	2,381	1,941	440
2008	3,294	1,852	1,442	2,965	1,852	1,112	3,294	2,038	1,257
2009	3,411	1,945	1,466	3,070	1,945	1,125	3,411	2,140	1,272
2010	4,785	2,042	2,743	4,306	2,042	2,264	4,785	2,247	2,538
2011	4,958	2,144	2,813	4,462	2,144	2,318	4,958	2,359	2,599
2012	7,026	2,252	4,774	6,323	2,252	4,071	7,026	2,477	4,549
2013	6,659	2,364	4,295	5,993	2,364	3,629	6,659	2,601	4,059
2014	8,667	2,483	6,185	7,801	2,483	5,318	8,667	2,731	5,936
2015	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2016	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2017	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2018	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2019	8,209	5,900	2,310	7,388	5,900	1,489	8,209	6,490	1,720
2020	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2021	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2022	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2023	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2024	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2025	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2026	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2027	8,209	2,607	5,603	7,388	2,607	4,782	8,209	2,867	5,342
2028	0	(2,056)	2,056	0	(2,056)	2,056	0	(2,261)	2,261
<b>Total</b>	<b>152,824</b>	<b>75,752</b>	<b>77,072</b>	<b>137,541</b>	<b>75,752</b>	<b>61,789</b>	<b>152,824</b>	<b>83,327</b>	<b>69,496</b>
<b>NPV at 12%</b>			1,030			(2,132)			(2,029)
<b>BCR</b>			1.03			0.93			0.94
<b>EIRR</b>			13%			11%			11%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Table A8.15: Economic Internal Rate of Return and Sensitivity Analyses  
Binmaley Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2003	9,056	37,514	(28,458)	8,150	37,514	(29,364)	9,056	41,265	(32,209)
2004	10,534	4,590	5,944	9,480	4,590	4,890	10,534	5,049	5,485
2005	11,930	7,612	4,318	10,737	7,612	3,125	11,930	8,373	3,557
2006	12,703	8,444	4,260	11,433	8,444	2,989	12,703	9,288	3,415
2007	14,785	9,317	5,468	13,307	9,317	3,990	14,785	10,249	4,536
2008	15,596	10,234	5,362	14,037	10,234	3,802	15,596	11,258	4,338
2009	18,392	11,197	7,194	16,552	11,197	5,355	18,392	12,317	6,074
2010	19,235	12,209	7,026	17,312	12,209	5,103	19,235	13,430	5,805
2011	22,923	13,271	9,652	20,630	13,271	7,360	22,923	14,598	8,325
2012	23,792	14,385	9,407	21,413	14,385	7,028	23,792	15,824	7,968
2013	26,643	15,556	11,087	23,978	15,556	8,422	26,643	17,112	9,531
2014	25,727	16,785	8,942	23,154	16,785	6,369	25,727	18,464	7,263
2015	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2016	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2017	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2018	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2019	24,870	21,367	3,504	22,383	21,367	1,017	24,870	23,503	1,367
2020	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2021	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2022	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2023	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2024	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2025	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2026	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2027	24,870	18,076	6,795	22,383	18,076	4,308	24,870	19,883	4,987
2028	0	(3,432)	3,432	0	(3,432)	3,432	0	(3,775)	3,775
<b>Total</b>	<b>534,631</b>	<b>395,959</b>	<b>138,671</b>	<b>481,167</b>	<b>395,959</b>	<b>85,208</b>	<b>534,631</b>	<b>435,555</b>	<b>99,076</b>
NPV at 15%			19,916			6,254			8,246
BCR			1.12			1.00			1.01
EIRR			21%			15%			16%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Table A8.16: Economic Internal Rate of Return and Sensitivity Analyses  
Bogo Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2003	4,230	27,209	(22,979)	3,807	27,209	(23,402)	4,230	29,930	(25,700)
2004	6,928	1,131	5,797	6,235	1,131	5,104	6,928	1,245	5,684
2005	7,783	2,203	5,580	7,005	2,203	4,801	7,783	2,424	5,359
2006	8,502	2,478	6,024	7,652	2,478	5,174	8,502	2,726	5,776
2007	8,495	2,766	5,729	7,646	2,766	4,879	8,495	3,043	5,452
2008	9,308	3,069	6,239	8,378	3,069	5,309	9,308	3,376	5,933
2009	9,285	3,387	5,898	8,356	3,387	4,969	9,285	3,726	5,559
2010	10,204	3,721	6,483	9,183	3,721	5,463	10,204	4,093	6,111
2011	10,160	4,071	6,089	9,144	4,071	5,073	10,160	4,478	5,682
2012	11,198	4,439	6,759	10,078	4,439	5,639	11,198	4,883	6,315
2013	10,915	4,825	6,090	9,824	4,825	4,999	10,915	5,308	5,608
2014	11,724	5,231	6,493	10,551	5,231	5,320	11,724	5,754	5,970
2015	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2016	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2017	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2018	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2019	11,332	7,682	3,649	10,198	7,682	2,516	11,332	8,451	2,881
2020	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2021	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2022	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2023	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2024	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2025	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2026	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2027	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2028	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2029	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2030	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2031	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2032	11,332	5,657	5,675	10,198	5,657	4,541	11,332	6,223	5,109
2033	0	(2,959)	2,959	0	(2,959)	2,959	0	(3,255)	3,255
<b>Total</b>	<b>312,700</b>	<b>165,424</b>	<b>147,276</b>	<b>281,430</b>	<b>165,424</b>	<b>116,006</b>	<b>312,700</b>	<b>181,966</b>	<b>130,734</b>
NPV at 15%			13,670			7,956			9,323
BCR			1.31			1.18			1.19
EIRR			26%			21%			22%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Table A8.17: Economic Internal Rate of Return and Sensitivity Analyses  
Digos Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2003	19,450	69,918	(50,468)	17,505	69,918	(52,413)	19,450	76,910	(57,460)
2004	22,687	3,614	19,072	20,418	3,614	16,804	22,687	3,976	18,711
2005	23,676	13,675	10,001	21,309	13,675	7,633	23,676	15,043	8,634
2006	25,752	15,815	9,937	23,177	15,815	7,362	25,752	17,396	8,356
2007	29,068	18,061	11,007	26,162	18,061	8,100	29,068	19,867	9,201
2008	31,267	20,420	10,847	28,140	20,420	7,720	31,267	22,462	8,805
2009	35,871	22,896	12,974	32,284	22,896	9,387	35,871	25,186	10,685
2010	38,188	25,497	12,691	34,370	25,497	8,873	38,188	28,047	10,142
2011	44,415	28,228	16,188	39,974	28,228	11,746	44,415	31,050	13,365
2012	46,845	31,095	15,750	42,160	31,095	11,066	46,845	34,204	12,641
2013	51,328	34,105	17,223	46,195	34,105	12,090	51,328	37,515	13,813
2014	50,364	37,266	13,098	45,328	37,266	8,062	50,364	40,992	9,371
2015	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2016	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2017	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2018	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2019	49,495	44,745	4,750	44,545	44,745	-200	49,495	49,220	275
2020	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2021	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2022	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2023	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2024	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2025	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2026	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2027	49,495	40,585	8,910	44,545	40,585	3,960	49,495	44,643	4,851
2028	0	(8,965)	8,965	0	(8,965)	8,965	0	(9,862)	9,862
<b>Total</b>	<b>1,062,342</b>	<b>843,387</b>	<b>218,954</b>	<b>956,107</b>	<b>843,387</b>	<b>112,720</b>	<b>1,062,342</b>	<b>927,726</b>	<b>134,616</b>
NPV at 12%			40,091			12,786			16,796
BCR			1.17			1.05			1.07
EIRR			26%			17%			18%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Table A8.18: Economic Internal Rate of Return and Sensitivity Analyses  
Dumangas Water Distirict**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2002	5,831	12,151	(6,320)	5,247	12,151	(6,903)	5,831	13,366	(7,535)
2003	5,795	8,979	(3,184)	5,215	8,979	(3,763)	5,795	9,876	(4,082)
2004	7,970	4,396	3,574	7,173	4,396	2,777	7,970	4,835	3,134
2005	7,969	5,292	2,678	7,172	5,292	1,881	7,969	5,821	2,149
2006	8,202	5,909	2,293	7,382	5,909	1,473	8,202	6,500	1,702
2007	9,283	6,558	2,725	8,355	6,558	1,797	9,283	7,214	2,069
2008	9,509	7,239	2,270	8,558	7,239	1,319	9,509	7,963	1,546
2009	10,886	7,954	2,932	9,797	7,954	1,843	10,886	8,750	2,136
2010	11,100	8,705	2,395	9,990	8,705	1,285	11,100	9,576	1,524
2011	12,836	9,494	3,342	11,552	9,494	2,059	12,836	10,443	2,393
2012	12,439	10,321	2,118	11,195	10,321	874	12,439	11,354	1,086
2013	13,791	11,191	2,600	12,412	11,191	1,221	13,791	12,310	1,481
2014	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2015	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2016	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2017	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2018	13,346	12,943	403	12,011	12,943	(932)	13,346	14,237	(892)
2019	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2020	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2021	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2022	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2023	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2024	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2025	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2026	13,346	12,103	1,242	12,011	12,103	(92)	13,346	13,314	32
2027	0	(1,411)	1,411	0	(1,411)	1,411	0	(1,552)	1,552
<b>Total</b>	<b>289,104</b>	<b>254,960</b>	<b>34,144</b>	<b>260,193</b>	<b>254,960</b>	<b>5,233</b>	<b>289,104</b>	<b>280,456</b>	<b>8,648</b>
NPV at 12%			6,173			(2,186)			(1,805)
BCR			1.09			0.96			0.97
EIRR			24%			8%			10%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Table A8.19: Economic Internal Rate of Return and Sensitivity Analyses  
Guimba Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2003	4,837	52,392	(47,555)	4,353	52,392	(48,039)	4,837	57,631	(52,794)
2004	7,032	2,701	4,331	6,329	2,701	3,628	7,032	2,971	4,061
2005	8,381	3,168	5,213	7,543	3,168	4,375	8,381	3,485	4,896
2006	8,644	3,545	5,099	7,779	3,545	4,235	8,644	3,899	4,745
2007	9,857	3,940	5,917	8,871	3,940	4,931	9,857	4,334	5,523
2008	10,126	4,355	5,771	9,113	4,355	4,758	10,126	4,790	5,336
2009	11,688	4,791	6,897	10,519	4,791	5,728	11,688	5,270	6,418
2010	11,960	5,248	6,712	10,764	5,248	5,516	11,960	5,773	6,187
2011	13,954	5,729	8,225	12,559	5,729	6,830	13,954	6,301	7,653
2012	14,226	6,233	7,993	12,803	6,233	6,570	14,226	6,856	7,370
2013	15,885	6,763	9,123	14,297	6,763	7,534	15,885	7,439	8,447
2014	15,349	7,319	8,030	13,814	7,319	6,495	15,349	8,051	7,298
2015	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2016	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2017	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2018	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2019	14,846	15,018	(172)	13,362	15,018	(1,656)	14,846	16,520	(1,673)
2020	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2021	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2022	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2023	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2024	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2025	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2026	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2027	14,846	7,903	6,944	13,362	7,903	5,459	14,846	8,693	6,153
2028	0	(4,303)	4,303	0	(4,303)	4,303	0	(4,733)	4,733
<b>Total</b>	<b>324,940</b>	<b>211,729</b>	<b>113,211</b>	<b>292,446</b>	<b>211,729</b>	<b>80,717</b>	<b>324,940</b>	<b>232,901</b>	<b>92,038</b>
NPV at 15%			(7,037)			(13,719)			(14,422)
BCR			0.90			0.81			0.82
EIRR			12%			9%			10%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.



**Table A8.20: Economic Internal Rate of Return and Sensitivity Analyses  
Samal Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2003	978	4,152	(3,174)	881	4,152	(3,272)	978	4,568	(3,589)
2004	2,769	4,784	(2,015)	2492	4,784	(2,292)	2,769	5,263	(2,493)
2005	3,795	1,587	2,209	3416	1,587	1,829	3,795	1,745	2,050
2006	3,940	1,707	2,234	3546	1,707	1,840	3,940	1,877	2,063
2007	3,950	1,832	2,118	3555	1,832	1,723	3,950	2,016	1,935
2008	4,253	1,965	2,288	3827	1,965	1,863	4,253	2,161	2,092
2009	4,253	2,103	2,149	3827	2,103	1,724	4,253	2,314	1,939
2010	4,570	2,249	2,320	4113	2,249	1,864	4,570	2,474	2,096
2011	4,560	2,402	2,158	4104	2,402	1,702	4,560	2,642	1,917
2012	4,892	2,563	2,330	4403	2,563	1,840	4,892	2,819	2,073
2013	4,703	2,731	1,972	4233	2,731	1,502	4,703	3,005	1,699
2014	4,865	2,908	1,957	4379	2,908	1,470	4,865	3,199	1,666
2015	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2016	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2017	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2018	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2019	4,682	4,831	(149)	4214	4,831	(617)	4,682	5,314	(632)
2020	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2021	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2022	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2023	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2024	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2025	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2026	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2027	4,682	3,094	1,588	4214	3,094	1,119	4,682	3,404	1,278
2028	0	(765)	765	0	(765)	765	0	(841)	841
<b>Total</b>	<b>108,397</b>	<b>72,183</b>	<b>36,213</b>	<b>97,557</b>	<b>72,183</b>	<b>25,373</b>	<b>108,397</b>	<b>79,402</b>	<b>28,995</b>
NPV at 15%			5,549			3,159			3,714
BCR			1.30			1.17			1.18
EIRR			34%			26%			27%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Table A8.21: Economic Internal Rate of Return and Sensitivity Analyses  
San Joaquin Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2004	0	10,383	(10,383)	0	10,383	(10,383)	0	11,422	(11,422)
2005	3,497	1,265	2,232	3,147	1,265	1,882	3,497	1,392	2,105
2006	3,380	1,329	2,051	3,042	1,329	1,713	3,380	1,462	1,919
2007	3,945	1,395	2,549	3,550	1,395	2,155	3,945	1,535	2,410
2008	3,810	1,465	2,345	3,429	1,465	1,964	3,810	1,611	2,198
2009	4,455	1,538	2,917	4,010	1,538	2,472	4,455	1,692	2,763
2010	4,300	1,615	2,685	3,870	1,615	2,255	4,300	1,777	2,523
2011	5,039	1,696	3,343	4,535	1,696	2,839	5,039	1,865	3,174
2012	4,860	1,781	3,079	4,374	1,781	2,593	4,860	1,959	2,901
2013	5,706	1,870	3,836	5,135	1,870	3,266	5,706	2,057	3,649
2014	5,427	1,963	3,464	4,885	1,963	2,921	5,427	2,160	3,268
2015	6,297	2,061	4,236	5,667	2,061	3,606	6,297	2,267	4,029
2016	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2017	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2018	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2019	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2020	5,986	3,164	2,822	5,388	3,164	2,224	5,986	3,480	2,506
2021	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2022	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2023	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
2024	5,986	2,164	3,822	5,388	2,164	3,223	5,986	2,381	3,605
<b>Total</b>	<b>104,592</b>	<b>48,841</b>	<b>55,751</b>	<b>94,133</b>	<b>48,841</b>	<b>45,292</b>	<b>104,592</b>	<b>53,725</b>	<b>50,867</b>
NPV at 12%			10,472			7,366			8,413
BCR			1.37			1.23			1.25
EIRR			25%			22%			22%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.

**Tabel A8.22: Economic Internal Rate of Return and Sensitivity Analyses  
Umingan Water District**

Year	Base Scenario			Sensitivity Analyses					
	Total	Total	Net	Scenario 1			Scenario 2		
	Economic Benefits	Economic Costs	Benefit	Benefits -10%	Costs 0%	Net	Benefits 0%	Costs +10%	Net
2002	0	8,548	(8,548)	0	8,548	(8,548)	0	9,403	(9,403)
2003	2,294	906	1,388	2,064	906	1,159	2,294	996	1,297
2004	2,314	1,004	1,309	2,082	1,004	1,078	2,314	1,105	1,209
2005	2,567	1,302	1,264	2,310	1,302	1,008	2,567	1,432	1,134
2006	2,761	1,464	1,296	2,485	1,464	1,020	2,761	1,611	1,150
2007	3,041	1,634	1,407	2,737	1,634	1,103	3,041	1,797	1,243
2008	3,238	1,813	1,426	2,915	1,813	1,102	3,238	1,994	1,245
2009	3,588	2,000	1,588	3,229	2,000	1,230	3,588	2,200	1,388
2010	3,789	2,197	1,592	3,410	2,197	1,213	3,789	2,416	1,372
2011	4,219	2,403	1,816	3,798	2,403	1,394	4,219	2,644	1,576
2012	4,208	2,620	1,587	3,787	2,620	1,167	4,208	2,882	1,325
2013	4,458	2,848	1,610	4,012	2,848	1,165	4,458	3,133	1,326
2014	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2015	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2016	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2017	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2018	4,444	4,447	(2)	4,000	4,447	(447)	4,444	4,891	(447)
2019	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2020	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2021	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2022	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2023	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2024	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2025	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2026	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2027	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2028	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2029	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2030	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2031	4,444	3,087	1,357	4,000	3,087	913	4,444	3,396	1,049
2032	0	(906)	906	0	(906)	906	0	(996)	996
<b>Total</b>	<b>116,473</b>	<b>84,759</b>	<b>31,714</b>	<b>104,826</b>	<b>84,759</b>	<b>20,067</b>	<b>116,473</b>	<b>93,235</b>	<b>23,238</b>
NPV at 15%			492			(1,383)			(1,334)
BCR			1.03			0.92			0.93
EIRR			16%			12%			12%

BCR = benefit cost ratio, EIRR = economic internal rate of return, NPV = net present value.

( ) = negative

Source: Local Water Utilities Administration.