

Table 12.7 Cost Flow of Capital Expenditures and O&M of Each Scheme

(Unit: US\$ 10⁶)

No.	Year	GOVw								BOTw								BOTa		Grand Total of Capital/ Replacement Cost
		Stage 1		Stage 2-1		Stage 2-2		Total		Stage 1		Stage 2-1		Stage 2-2		Total		Stage 2-2		
		Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	Cap. Cost	O&M Cost	
1	2004							0.0	0.0							0.0	0.0			0.0
2	2005	4.5						4.5	0.0	0.6						0.6	0.0			5.0
3	2006	6.4		1.4				7.8	0.0	0.9						0.9	0.0			8.6
4	2007	8.1		1.4				9.5	0.0	0.9						0.9	0.0			10.4
5	2008	8.3		2.9				11.1	0.0	0.9						0.9	0.0			12.1
6	2009	44.4		2.9				47.3	0.0	31.0						31.0	0.0			78.3
7	2010	76.8		3.0				79.8	0.0	61.7						61.7	0.0			141.5
8	2011	72.8		65.3				138.2	0.0	87.9						87.9	0.0			226.1
9	2012	73.1		171.0				244.1	0.0	92.0						92.0	0.0	5.4		341.5
10	2013	44.4		145.5				189.9	0.0	59.9						59.9	0.0	8.5		258.3
11	2014		1.9	133.1		1.0		134.1	1.9		1.7			0.5		0.5	1.7	9.8		144.4
12	2015		1.9	136.3		57.1		193.4	1.9	68.1			1.1		69.2	1.7	50.9			313.4
13	2016		1.9	75.2		69.3		144.5	1.9	69.7			73.4		143.1	1.7	47.5			335.2
14	2017		1.9		3.9			65.7	5.7		1.7	0.7	113.0		113.0	2.4		2.3		178.8
15	2018		1.9		3.9			62.2	5.7		1.7	0.7	110.4		110.4	2.4		2.3		172.7
16	2019		1.9		3.9	15.1		15.1	5.7		1.7	0.7	82.4		82.4	2.4		2.3		97.5
17	2020		1.9		3.9		1.4	0.0	7.1		1.7	0.7	0.0		0.0	2.4		2.3		0.0
18	2021		1.9		3.9		1.4	0.0	7.1		1.7	0.7	108.4		108.4	2.4		2.3		108.4
19	2022		1.9		3.9		1.4	0.0	7.1		1.7	0.7	111.0		111.0	2.4		2.3		111.0
20	2023		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
21	2024		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
22	2025		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
23	2026		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
24	2027		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
25	2028		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
26	2029		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
27	2030		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
28	2031		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
29	2032		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
30	2033	7.5		1.9		3.9		1.4	7.5	84.9		1.7	0.7	3.0	84.9	5.4		2.3		92.4
31	2034		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
32	2035		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
33	2036		1.9	8.3		3.9		1.4	8.3		1.7	0.7	63.7		63.7	5.4	76.3		2.3	148.3
34	2037		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
35	2038		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
36	2039		1.9		3.9	2.5		1.4	2.5		1.7	0.7		3.0	0.0	5.4		2.3		2.5
37	2040		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
38	2041		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
39	2042		1.9		3.9		1.4	0.0	7.1		1.7	0.7	186.2		186.2	5.4		2.3		186.2
40	2043		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
41	2044		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
42	2045		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
43	2046		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
44	2047		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
45	2048		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
46	2049		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
47	2050		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
48	2051		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
49	2052	7.5		1.9		3.9		1.4	7.5	84.9		1.7	0.7	3.0	84.9	5.4		2.3		92.4
50	2053		1.9		3.9		1.4	0.0	7.1		1.7	0.7		3.0	0.0	5.4		2.3		0.0
Total		353.8		746.3		273.0		1,373.0		505.7		201.5		786.5		1,493.7		198.3		3,065.0
Financial Cost		338.8		737.9		270.5		1,347.3		335.8		137.8		600.3		1,073.9		122.0		2,543.3
Rep. Cost (financial)		15.0		8.3		2.5		25.8		169.9		63.7		186.2		419.8		76.3		521.8

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Table 12.8 Equalizing Water Rate of GOVw for Stage 2-2 (EWR 2-2-G)

Equalizing Water Rate= 7.284 Pesos/m³ (Unit: US\$ 10⁶)

No.	Year	Capital	O&M	Other O&M costs		IDC	Total GOVw	Water Supply	Water Tariff	Water Sales	B - C	
		Costs	Costs	Coastal	Land Slide	St.1~St.2-2						Costs
		St.1~St.2-2	St.1~St.2-2	Prevention	Prevention	St.1~St.2-2						
1	2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	
2	2005	4.5	0.0	0.0	0.0	0.0	4.5	0.0	8.0	0.0	-4.5	
3	2006	7.8	0.0	0.0	0.0	0.0	7.8	0.0	8.2	0.0	-7.8	
4	2007	9.5	0.0	0.0	0.0	0.0	9.5	0.0	8.4	0.0	-9.5	
5	2008	11.1	0.0	0.0	0.0	0.0	11.1	0.0	8.7	0.0	-11.1	
6	2009	47.3	0.0	0.0	0.0	0.0	47.3	0.0	9.0	0.0	-47.3	
7	2010	79.8	0.0	0.0	0.0	0.0	79.8	0.0	9.2	0.0	-79.8	
8	2011	138.2	0.0	0.0	0.0	0.0	138.2	0.0	9.5	0.0	-138.2	
9	2012	244.1	0.0	0.0	0.0	0.0	244.1	0.0	9.8	0.0	-244.1	
10	2013	189.9	0.0	0.0	0.0	0.0	189.9	0.0	10.1	0.0	-189.9	
11	2014	134.1	1.9	0.0	0.0	7.8	143.7	613.8	10.4	44.7	-99.0	
12	2015	193.4	1.9	0.0	0.0	7.4	202.6	613.8	10.7	46.1	-156.5	
13	2016	144.5	1.9	0.0	0.0	6.9	153.3	613.8	11.0	47.5	-105.9	
14	2017	65.7	5.7	0.0	0.0	23.6	95.1	1248.4	11.3	99.4	4.4	
15	2018	62.2	5.7	0.0	4.8	22.2	95.0	1356.3	11.7	111.3	16.3	
16	2019	15.1	5.7	0.0	5.0	20.9	46.7	1356.3	12.0	114.6	67.9	
17	2020	0.0	7.1	0.0	5.1	25.7	38.0	1871.1	12.4	162.9	124.9	
18	2021	0.0	7.1	0.0	5.3	24.0	36.4	2091.9	12.8	187.5	151.1	
19	2022	0.0	7.1	8.4	5.4	22.3	43.2	2227.5	13.2	205.7	162.5	
20	2023	0.0	7.1	0.0	5.6	20.5	33.3	2532.4	13.6	240.9	207.6	
21	2024	0.0	7.1	0.0	5.7	18.8	31.7	2753.2	14.0	269.7	238.0	
22	2025	0.0	7.1	0.0	5.9	17.1	30.2	2970.0	14.4	299.7	269.5	
23	2026	0.0	7.1	0.0	6.1	15.4	28.6	2970.0	14.8	308.7	280.1	
24	2027	0.0	7.1	9.5	6.3	13.6	36.6	2970.0	15.3	317.9	281.3	
25	2028	0.0	7.1	0.0	6.5	11.9	25.5	2970.0	15.7	327.5	301.9	
26	2029	0.0	7.1	0.0	6.7	10.2	24.0	2970.0	16.2	337.3	313.3	
27	2030	0.0	7.1	0.0	6.9	8.6	22.6	2970.0	16.7	347.4	324.8	
28	2031	0.0	7.1	0.0	7.1	7.1	21.3	2970.0	17.2	357.8	336.6	
29	2032	0.0	7.1	10.8	7.3	5.5	30.8	2970.0	17.7	368.6	337.8	
30	2033	7.5	7.1	0.0	7.5	4.3	26.5	2970.0	18.2	379.6	353.2	
31	2034	0.0	7.1	0.0	7.7	3.1	18.0	2970.0	18.8	391.0	373.0	
32	2035	0.0	7.1	0.0	8.0	2.2	17.3	2970.0	19.3	402.8	385.4	
33	2036	8.3	7.1	0.0	8.2	1.4	25.1	2970.0	19.9	414.8	389.8	
34	2037	0.0	7.1	12.3	0.0	0.6	20.1	2970.0	20.5	427.3	407.2	
35	2038	0.0	7.1	0.0	0.0	0.4	7.6	2970.0	21.1	440.1	432.5	
36	2039	2.5	7.1	0.0	0.0	0.2	9.8	2970.0	21.7	453.3	443.5	
37	2040	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	22.4	466.9	459.8	
38	2041	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	23.1	480.9	473.8	
39	2042	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	23.8	495.3	488.2	
40	2043	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	24.5	510.2	503.1	
41	2044	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	25.2	525.5	518.4	
42	2045	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	26.0	541.3	534.1	
43	2046	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	26.7	557.5	550.4	
44	2047	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	27.5	574.2	567.1	
45	2048	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	28.4	591.5	584.3	
46	2049	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	29.2	609.2	602.1	
47	2050	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	30.1	627.5	620.3	
48	2051	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	31.0	646.3	639.2	
49	2052	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	31.9	665.7	658.6	
50	2053	0.0	7.1	0.0	0.0	0.0	7.1	2970.0	32.9	685.7	678.5	
NPV (12%) =							497.9	497.9				
								FIRR = 12.00%				
								B/C(12%)= 1.0				

Table 12.9 Equalizing Water Rate of BOTw for Stage 2-2 (EWR 2-2-B)

Equalizing water rate=		12.005 Pesos/m ³					(Unit: US\$ 10 ⁶)				
No.	Year	Capital	O&M	Total	GOVw	IDC	BOTw	Water	Water tariff	BOTw	B - C
		Costs	Costs	Costs	Purchase		Total	SR exit	incl. GOVw	Water	incl. GOVw
		St.1~St.2-2	St.1~St.2-2	Costs	St.1~St.2-2	St.1~St.2-2	Cost	(MLD)	(Pesos /m ³)	Sales	
1	2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	0.0	0.0
2	2005	0.6	0.0	0.6	0.0	0.0	0.6	0.0	13.1	0.0	-0.6
3	2006	0.9	0.0	0.9	0.0	0.0	0.9	0.0	13.5	0.0	-0.9
4	2007	0.9	0.0	0.9	0.0	0.0	0.9	0.0	13.9	0.0	-0.9
5	2008	0.9	0.0	0.9	0.0	0.0	0.9	0.0	14.3	0.0	-0.9
6	2009	31.0	0.0	31.0	0.0	0.0	31.0	0.0	14.8	0.0	-31.0
7	2010	61.7	0.0	61.7	0.0	0.0	61.7	0.0	15.2	0.0	-61.7
8	2011	87.9	0.0	87.9	0.0	0.0	87.9	0.0	15.7	0.0	-87.9
9	2012	92.0	0.0	92.0	0.0	0.0	92.0	0.0	16.1	0.0	-92.0
10	2013	59.9	0.0	59.9	0.0	0.0	59.9	0.0	16.6	0.0	-59.9
11	2014	0.5	1.7	2.2	44.7	5.5	52.5	607.6	17.1	73.0	20.5
12	2015	69.2	1.7	70.9	46.1	5.2	122.1	607.6	17.6	75.2	-46.9
13	2016	143.1	1.7	144.8	47.5	4.8	197.1	607.6	18.2	77.4	-119.6
14	2017	113.0	2.4	115.4	99.4	11.1	225.9	1,235.8	18.7	162.2	-63.7
15	2018	110.4	2.4	112.8	111.3	10.2	234.2	1,342.6	19.3	181.5	-52.7
16	2019	82.4	2.4	84.7	114.6	9.3	208.6	1,342.6	19.8	187.0	-21.7
17	2020	0.0	2.4	2.4	162.9	8.4	173.6	1,852.2	20.4	265.7	92.1
18	2021	108.4	2.4	110.8	187.5	7.5	305.8	2,070.7	21.0	306.0	0.1
19	2022	111.0	2.4	113.3	205.7	6.6	325.7	2,205.0	21.7	335.6	9.9
20	2023	0.0	5.4	5.4	240.9	17.3	263.6	2,506.8	22.3	393.0	129.4
21	2024	0.0	5.4	5.4	269.7	15.6	290.7	2,725.4	23.0	440.0	149.3
22	2025	0.0	5.4	5.4	299.7	13.9	319.0	2,940.0	23.7	488.9	170.0
23	2026	0.0	5.4	5.4	308.7	12.2	326.2	2,940.0	24.4	503.6	177.4
24	2027	0.0	5.4	5.4	317.9	10.5	333.8	2,940.0	25.1	518.7	184.9
25	2028	0.0	5.4	5.4	327.5	8.8	341.6	2,940.0	25.9	534.3	192.7
26	2029	0.0	5.4	5.4	337.3	7.0	349.7	2,940.0	26.7	550.3	200.6
27	2030	0.0	5.4	5.4	347.4	6.1	358.9	2,940.0	27.5	566.8	207.9
28	2031	0.0	5.4	5.4	357.8	5.1	368.3	2,940.0	28.3	583.8	215.5
29	2032	0.0	5.4	5.4	368.6	0.0	374.0	2,940.0	29.1	601.3	227.4
30	2033	84.9	5.4	90.3	379.6	0.0	469.9	2,940.0	30.0	619.3	149.4
31	2034	0.0	5.4	5.4	391.0	0.0	396.4	2,940.0	30.9	637.9	241.5
32	2035	0.0	5.4	5.4	402.8	0.0	408.1	2,940.0	31.8	657.1	248.9
33	2036	63.7	5.4	69.1	414.8	0.0	483.9	2,940.0	32.8	676.8	192.8
34	2037	0.0	5.4	5.4	427.3	0.0	432.7	2,940.0	33.8	697.1	264.4
35	2038	0.0	5.4	5.4	440.1	0.0	445.5	2,940.0	34.8	718.0	272.5
36	2039	0.0	5.4	5.4	453.3	0.0	458.7	2,940.0	35.8	739.5	280.9
37	2040	0.0	5.4	5.4	466.9	0.0	472.3	2,940.0	36.9	761.7	289.4
38	2041	0.0	5.4	5.4	480.9	0.0	486.3	2,940.0	38.0	784.6	298.3
39	2042	186.2	5.4	191.6	495.3	0.0	687.0	2,940.0	39.2	808.1	121.2
40	2043	0.0	5.4	5.4	510.2	0.0	515.6	2,940.0	40.3	832.4	316.8
41	2044	0.0	5.4	5.4	525.5	0.0	530.9	2,940.0	41.5	857.3	326.4
42	2045	0.0	5.4	5.4	541.3	0.0	546.6	2,940.0	42.8	883.0	336.4
43	2046	0.0	5.4	5.4	557.5	0.0	562.9	2,940.0	44.1	909.5	346.7
44	2047	0.0	5.4	5.4	574.2	0.0	579.6	2,940.0	45.4	936.8	357.2
NPV (12%) =							783.4				
Cap. Cost=		1,073.9					783.4				
							FIRR= 12.00%				
							B/C(12%)= 1.0				

Table 12.10 Assumptions on Financial Analysis for GOVw Scheme

No.	Item	Amount		Remarks	
		Foreign (Mill. US\$)	Local (Mill. US\$)	Total (Mill. US\$)	
1.	Capital Cost (Base Cost)				
	2005			4.5	
	2006			7.8	
	2007			9.5	
	2008			11.1	
	2009			47.3	
	2010			79.8	
	2011			138.2	
	2012			244.1	
	2013			189.9	
	2014			134.1	
	2015			193.4	
	2016			144.5	
	2017			65.7	
	2018			62.2	
	2019			15.1	
	Total			1,347.3	1,347.3
2.	Fund Source	Foreign (Mill. US\$)	Local (Mill. US\$)	Total (Mill. US\$)	Repayment period (year)
	(1) GOP contribution			146.3	
	(2) Loan			1,278.7	
	2-1) ODA loan			1,055.7	20
	- Stage 1			264.3	
	- Stage 2-1			579.6	
	- Stage 2-2			211.8	
	2-2) DFI loan			223.0	15
	- Stage 1			55.5	
	- Stage 2-1			122.8	
	- Stage 2-2			44.7	
	Total			1,425.0	
3.	Loan Interest Rate				
	ODA loan	2.0%			
	DFI loan	4.5%			
4.	Construction Period				
	- Stage 1	9	years		
	- Stage 2-1	11			
	- Stage 2-2	6			
6.	Concession period	(None)			
10.	Tariff				
	Initial tariff (Pesos/m ³)	7.3	2002 price		
	Escalation rate	3.0%			
11.	Annual O & M Costs				
	Stage 1	1.9	(Mill. US\$)		
	Stage 2-1	3.9			
	Stage 2-2	1.4			
13.	Depreciation/Amortization	Financial charge	Capital assets		
	Period (years)	5	50		
	Residual value	0%	10%		
	Method	Straight-line	Straight-line		
14.	Debt service reserve	50%		50% of annual debt service	
15.	Initial working capital	50%	of annual O&M cost in one year prior to operation start		
16.	Income tax rate	35%	from 7th year of operation		
17.	Dividend rate	90%	of net profit		
18.	GOP share	10%			
19.	Exchange Rate	Peso 52 per US\$			

Table 12.11 Financing Costs (IDC and Financial Charges) for GOVw Scheme

Financial Terms

Source	Interest	Front-end fee	Commitment fee	Repayment period (years)	Share
ODA loan	0.02			20	0.8333
DFI loan	0.045	0.01	0.0075	15	0.1667
Total					1

Interests during Construction (IDC)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	St. 1 total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	St. 2-1 total	2014	2015	2016	2017	2018	2019	St. 2-2 total	Total	
Disbursement of Base Cost																															
Ratio																															
Amount (M\$)	4.4599	6.3905	8.098	8.2884	44.376	76.816	72.816	73.136	44.417	338.8	1.3606	1.3936	2.855	2.9244	2.9956	65.346	170.96	145.49	133.07	136.33	75.223	737.95	1.0188	57.066	69.316	65.738	62.238	15.135	270.51	1347.25	
GOP contr. (excl. fees and IWC)																															
Ratio																															
Amount (M\$)	4.4599	6.3905	8.098	8.2884	6.6429					33.88	1.3606	1.3936	2.855	2.9244	2.9956	62.265						73.795	1.0188	26.032					27.051	134.725	
Loan (M\$)																															
ODA loan																															
Disburse					31.444	64.013	60.68	60.946	37.014	254.1						2.567	142.46	121.24	110.9	113.61	62.686	553.46			25.861	57.763	54.782	51.865	12.612	202.88	1010.44
Interest					0	0.6289	1.9217	3.1738	4.4562	10.181						0	0.0513	2.9016	5.3845	7.7101	10.136	26.184			0	0.5172	1.6828	2.8121	3.9057	8.9178	45.2823
Total					31.444	64.642	62.602	64.12	41.47	264.28						2.567	142.51	124.14	116.28	121.32	72.822	579.64			25.861	58.281	56.465	54.677	16.518	211.8	1055.72
DFI loan																															
Disburse					6.2888	12.803	12.136	12.189	7.4028	50.82						0.5134	28.493	24.248	22.179	22.721	12.537	110.69			5.1722	11.553	10.956	10.373	2.5225	40.577	202.088
Interest					0	0.283	0.8718	1.4572	2.0713	4.6833						0	0.0231	1.3063	2.4563	3.5648	4.7477	12.098			0	0.2327	0.7631	1.2905	1.8153	4.1016	20.8832
Total					6.2888	13.086	13.008	13.646	9.4741	55.503						0.5134	28.516	25.554	24.635	26.286	17.285	122.79			5.1722	11.785	11.719	11.663	4.3378	44.678	222.971
Total Loan (M\$)																															
Disburse					37.733	76.816	72.816	73.136	44.417	304.92						3.0805	170.96	145.49	133.07	136.33	75.223	664.15			31.033	69.316	65.738	62.238	15.135	243.46	1212.53
Interest					0	0.9119	2.7936	4.631	6.5274	14.864						0	0.0744	4.2079	7.8407	11.275	14.884	38.282			0	0.75	2.4459	4.1026	5.721	13.019	66.1655
Total					37.733	77.728	75.61	77.767	50.944	319.78						3.0805	171.03	149.7	140.92	147.6	90.107	702.43			31.033	70.066	68.184	66.34	20.856	256.48	1278.69
GOP (excl. fees) + Loan	4.4599	6.3905	8.098	8.2884	44.376	77.728	75.61	77.767	50.944	353.66	1.3606	1.3936	2.7543	2.9244	2.9956	65.346	171.03	149.7	140.92	147.6	90.107	776.23	1.0188	57.066	70.066	68.184	66.34	20.856	283.53	1413.42	
Front-end Fee																															
ODA loan					0					0						0							0								
DFI loan					0.555					0.555						1.2279						1.2279				0.4468				0.4468	2.22971
Total					0.555					0.555						1.2279						1.2279				0.4468				0.4468	2.22971
Commitment Fee																															
ODA loan					0	0	0	0	0	0																					
DFI loan					0.4163	0.3691	0.271	0.1734	0.0711	1.3008						0.9209	0.9171	0.7032	0.5115	0.3268	0.1296	3.5092			0.3351	0.2963	0.2079	0.12	0.0325	0.9918	5.80181
Total					0.4163	0.3691	0.271	0.1734	0.0711	1.3008						0.9209	0.9171	0.7032	0.5115	0.3268	0.1296	3.5092			0.3351	0.2963	0.2079	0.12	0.0325	0.9918	5.80181
Total of Fees	0	0	0	0	0.9713	0.3691	0.271	0.1734	0.0711	1.8558	0	0	0	0	0	2.1488	0.9171	0.7032	0.5115	0.3268	0.1296	4.7371	0	0.7819	0.2963	0.2079	0.12	0.0325	1.4386	8.03152	
Initial working capital (IWC)									0.9302	0.9302												1.9373	1.9373								
GOP + Loan + Fees + IWC	4.4599	6.3905	8.098	8.2884	45.347	78.097	75.881	77.94	51.946	356.45	1.3606	1.3936	2.855	2.9244	2.9956	67.495	171.95	150.4	141.43	147.93	92.174	782.9	1.0188	57.847	70.362	68.392	66.46	21.592	285.67	1425.02	

GOP/(GOP + Loan) ratio = 0.1027 (GOP includes financial fees and IWC)

Table 12.13 Assumptions on Financial Analysis for BOTw Scheme

No.	Item	Amount		Remarks	
1.	Capital Cost (Base Cost)	Foreign (Mill. US\$)	Local (Mill. US\$)	Total (Mill. US\$)	
	2005			0.6	at 2002 prices
	2006			0.9	
	2007			0.9	
	2008			0.9	
	2009			31.0	
	2010			61.7	
	2011			87.9	
	2012			92.0	
	2013			59.9	
	2014			0.5	
	2015			69.2	
	2016			143.1	
	2017			113.0	
	2018			110.4	
2019			82.4		
2020			0.0		
2021			108.4		
2022			111.0		
	Total			1,073.9	1,073.9
2.	Fund Source	Foreign (Mill. US\$)	Local (Mill. US\$)	Total (Mill. US\$)	Repayment period (year)
	Equity			401.3	
	Loan				
	DFI loan			399.9	15
	Stage 1			123.1	
	Stage 2-1			48.7	
	Stage 2-2			228.1	
	Commercial bank			370.3	10
	Stage 1			111.4	
	Stage 2-1			42.3	
Stage 2-2			216.6		
	Total			1171.5	1171.5
3.	Loan Interest Rate				
	DFI loan	4.5%			
	Commercial bank	10.0%			
4.	Construction Period				
	Stage 1		9 years		
	Stage 2-1		2		
	Stage 2-2		8		
6.	Concession period	25 years from operation start			
10.	Tariff				
	Initial tariff (Pesos/m ³)	15.4	2002 price		
	Escalation rate	3.0%			
11.	Annual O & M Costs				
	Stage 1	1.7 M\$			
	Stage 2-1	0.7			
	Stage 2-2	3.0			
13.	Depreciation/Amortization	Financial charge	Capital assets		
	Period (years)	5	25		
	Residual value	0%	0%		
	Method	Straight-line	Straight-line		
14.	Debt service reserve	50%		50% of annual debt service	
15.	Initial working capital	50% of annual O&M cost in one year prior to operation start			
16.	Income tax rate	35% from 7th year of operation			
17.	Dividend rate	90% of net profit			
18.	Equity share	35%			
19.	Exchange Rate	Peso 52 per US\$			

Table 12.14 Financing Costs (IDC and Financial Charges) of BOTw Scheme

Financial Terms

Source	Interest	Front-end fee	Commitment fee	Repayment period (years)	Share
DFI loan	4.5%	1.0%	0.75%	15	54%
Commercial loan	10.0%	1.0%	0.75%	10	46%
Total					100%

Interests during Construction (IDC)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	St. 1 total	2015	2016	St. 2-1 total	2014	2015	2016	2017	2018	2019	2020	2021	2022	St. 2-2 total	Total	
Disbursement of Base Cost																									
Ratio	0%	0%	0%	0%	9%	18%	26%	27%	18%	100%	49%	51%	100%	0%	0%	12%	19%	18%	14%	0%	18%	18%	100%		
Amount (Mill. US\$)	0.6	0.9	0.9	0.9	31.0	61.7	87.9	92.0	59.9	335.8	68.1	69.7	137.8	0.5	1.1	73.4	113.0	110.4	82.4	0.0	108.4	111.0	600.3	1,073.9	
Equity (excl. fees and IWC)																									
Ratio																									
Amount (Mill. US\$)	0.6	0.9	0.9	0.9	31.0	61.7	21.5			117.5	48.2		48.2	0.5	1.1	73.4	113.0	22.0					210.1	375.9	
Loan (Mill. US\$)																									
DFI loan																									
Disburse								35.7	49.5	32.2	117.5	10.7	37.5	48.2				47.6	44.4	0.0	58.4	59.8	210.1	375.9	
Interest								0.0	1.6	3.9	5.5	0.0	0.5	0.5				0.0	2.1	4.2	4.4	7.3	18.1	24.1	
Total								35.7	51.2	36.1	123.1	10.7	38.0	48.7				47.6	46.5	4.2	62.8	67.0	228.1	399.9	
Commercial loan																									
Disburse								30.6	42.5	27.6	100.7	9.2	32.2	41.3				40.8	38.0	0.0	50.0	51.2	180.1	322.2	
Interest								0.0	3.1	7.6	10.7	0.0	0.9	0.9				0.0	4.1	8.3	9.1	15.0	36.5	48.1	
Total								30.6	45.5	35.2	111.4	9.2	33.1	42.3				40.8	42.1	8.3	59.1	66.3	216.6	370.3	
Total Loan (Mill. US\$)																									
Disburse								66.4	92.0	59.9	218.3	19.9	69.7	89.6				88.4	82.4	0.0	108.4	111.0	390.2	698.0	
Interest								0.0	4.7	11.5	16.2	0.0	1.4	1.4				0.0	6.2	12.5	13.5	22.3	54.6	72.2	
Total								66.4	96.7	71.4	234.5	19.9	71.1	91.0				88.4	88.6	12.5	121.9	133.3	444.8	770.2	
Equity (excl. fees) + Loan	0.6	0.9	0.9	0.9	31.0	61.7	87.9	96.7	71.4	352.0	68.1	71.1	139.2	0.5	1.1	73.4	113.0	110.4	88.6	12.5	121.9	133.3	654.8	1,146.1	
Front-end Fee																									
DFI loan										1.2		1.2	0.5	0.5				2.3					2.3	4.0	
Commercial loan										1.1		1.1	0.4	0.4				2.2					2.2	3.7	
Total										2.3		2.3	0.9	0.9				4.4					4.4	7.7	
Commitment Fee																									
DFI loan										0.9	0.7	0.3	1.8	0.3	0.0	0.3			1.7	1.4	1.0	1.0	0.5	5.5	7.7
Commercial loan										0.8	0.6	0.3	1.7	0.2	0.0	0.2			1.6	1.3	1.0	0.9	0.5	5.4	7.3
Total										1.8	1.3	0.5	3.6	0.5	0.0	0.5			3.3	2.7	2.0	1.9	1.0	10.9	15.0
Total of Fees	0.0	0.0	0.0	0.0	0.0	0.0	4.1	1.3	0.5	5.9	1.4	0.0	1.4	0.0	0.0	0.0	0.0	7.8	2.7	2.0	1.9	1.0	15.4	22.7	
Initial working capital (IWC)										0.8	0.8		0.3	0.3									1.5	1.5	2.7
Equity + Loan + Fees + IWC	0.6	0.9	0.9	0.9	31.0	61.7	92.0	98.0	72.8	358.7	69.5	71.5	141.0	0.5	1.1	73.4	113.0	118.2	91.3	14.5	123.9	135.8	671.7	1,171.5	

Equity/(Equity + Loan) ratio = 34.3% (Equity includes financial fees and IWC)

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Table 12.16 Calculation of Financial Internal Rate of Return (FIRR) for BOTw Scheme

No.	Year	Capital Cost (Mill. US\$)	Initial Working Capital (Mill. US\$)	O & M Cost (Mill. US\$)	Raw Water Purchase GOVw (Mill. US\$)	Total Costs BOTw (Mill. US\$)	Total Water Supply (MLD)	Water Tariff (P/cum)	Operating Revenue (Mill. US\$)	Income Tax (Mill. US\$)	Internal Cash Generation (Mill. US\$)	Net Benefits (Mill. US\$)
1	2004					0.0						0.0
2	2005	0.6				0.6						-0.6
3	2006	0.9				0.9						-0.9
4	2007	0.9				0.9						-0.9
5	2008	0.9				0.9						-0.9
6	2009	31.0				31.0						-31.0
7	2010	61.7				61.7						-61.7
8	2011	87.9				87.9						-87.9
9	2012	92.0				92.0						-92.0
10	2013	59.9	0.8			60.7						-60.7
11	2014	0.5		1.7	44.7	47.0	620.0	22.6	96.4		96.4	49.5
12	2015	69.2		1.7	46.1	117.0	620.0	23.3	99.3		99.3	-17.6
13	2016	143.1	0.3	1.7	47.5	192.6	620.0	24.0	102.3		102.3	-90.3
14	2017	113.0		2.4	99.4	214.8	1391.0	24.7	236.4		236.4	21.6
15	2018	110.4		2.4	111.3	224.1	1500.0	25.5	262.6		262.6	38.5
16	2019	82.4		2.4	114.6	199.4	1500.0	26.2	270.5		270.5	71.1
17	2020	0.0		2.4	162.9	165.2	1890.0	27.0	351.0	38.8	312.2	147.0
18	2021	108.4		2.4	187.5	298.3	2113.0	27.8	404.2	49.0	355.2	56.9
19	2022	111.0	1.5	2.4	205.7	320.5	2250.0	28.6	443.3	56.7	386.6	66.1
20	2023			5.4	240.9	246.2	2558.0	29.5	519.2	59.7	459.4	213.2
21	2024			5.4	269.7	275.1	2781.0	30.4	581.4	72.5	508.9	233.8
22	2025			5.4	299.7	305.1	3000.0	31.3	645.9	86.4	559.6	254.5
23	2026			5.4	308.7	314.0	3000.0	32.2	665.3	91.1	574.2	260.2
24	2027			5.4	317.9	323.3	3000.0	33.2	685.3	96.0	589.3	266.0
25	2028			5.4	327.5	332.8	3000.0	34.2	705.8	100.8	605.0	272.2
26	2029			5.4	337.3	342.7	3000.0	35.2	727.0	105.8	621.3	278.6
27	2030			5.4	347.4	352.8	3000.0	36.3	748.8	110.7	638.2	285.4
28	2031			5.4	357.8	363.2	3000.0	37.4	771.3	115.7	655.6	292.4
29	2032			5.4	368.6	374.0	3000.0	38.5	794.4	120.9	673.6	299.6
30	2033			5.4	379.6	385.0	3000.0	39.7	818.3	126.1	692.2	307.2
31	2034			5.4	391.0	396.4	3000.0	40.8	842.8	130.7	712.1	315.7
32	2035			5.4	402.8	408.1	3000.0	42.1	868.1	136.1	732.0	323.8
33	2036			5.4	414.8	420.2	3000.0	43.3	894.1	140.8	753.4	333.2
34	2037			5.4	427.3	432.7	3000.0	44.6	921.0	145.5	775.5	342.8
35	2038			5.4	440.1	445.5	3000.0	46.0	948.6	150.4	798.2	352.7
36	2039			5.4	453.3	458.7	3000.0	47.3	977.1	160.4	816.7	358.0
37	2040			5.4	466.9	472.3	3000.0	48.8	1006.4	165.6	840.8	368.5
38	2041			5.4	480.9	486.3	3000.0	50.2	1036.6	171.0	865.6	379.3
39	2042			5.4	495.3	500.7	3000.0	51.7	1067.7	178.4	889.2	388.5
40	2043			5.4	510.2	515.6	3000.0	53.3	1099.7	184.1	915.6	400.0
41	2044			5.4	525.5	530.9	3000.0	54.9	1132.7	190.0	942.7	411.8
42	2045			5.4	541.3	546.6	3000.0	56.5	1166.7	205.2	961.5	414.8
43	2046			5.4	557.5	562.9	3000.0	58.2	1201.6	211.4	990.3	427.4
44	2047			5.4	574.2	579.6	3000.0	60.0	1237.7	217.8	1019.9	440.3
Financial Internal Rate of Return									=	17.6%		
Net Present Value (at 12% discount rate)									=	173.08 (Million US\$)		

Table 12.17 Calculation of Return on Equity (ROE) for BOTw Scheme

(Umit: US\$ 10⁶)

No.	Year	Equity Capital	Dividend (nominal)	Cash Surplus (nominal)	Total Income		Net Benefits		
					(nominal)	(real)	(nominal)	(real)	
1	2004				0.0	0.0	0.0	0.0	
2	2005	0.6			0.0	0.0	(0.6)	-0.6	
3	2006	0.9			0.0	0.0	(0.9)	-0.9	
4	2007	0.9			0.0	0.0	(0.9)	-0.9	
5	2008	0.9			0.0	0.0	(0.9)	-0.9	
6	2009	31.0			0.0	0.0	(31.0)	-31.0	
7	2010	61.7			0.0	0.0	(61.7)	-61.7	
8	2011	25.6			0.0	0.0	(25.6)	-25.6	
9	2012	1.3			0.0	0.0	(1.3)	-1.3	
10	2013	1.4			0.0	0.0	(1.4)	-1.4	
11	2014	0.5	0.0	14.0	14.0	10.1	13.5	9.6	
12	2015	50.8	0.0	17.0	17.0	11.9	(33.7)	-38.8	
13	2016	73.8	3.6	16.5	20.1	13.7	(53.7)	-60.1	
14	2017	113.0	66.4	22.7	89.2	58.9	(23.9)	-54.1	
15	2018	29.8	83.8	21.7	105.5	67.7	75.8	38.0	
16	2019	2.7	91.5	20.7	112.1	69.9	109.5	67.2	
17	2020	2.0	70.8	30.3	101.1	61.2	99.1	59.2	
18	2021	1.9	88.7	32.2	121.0	71.1	119.1	69.1	
19	2022	2.5	102.4	33.5	135.8	77.5	133.3	75.0	
20	2023		55.0	51.0	106.0	58.7	106.0	58.7	
21	2024		99.0	43.0	142.0	76.3	142.0	76.3	
22	2025		124.8	41.1	165.9	86.6	165.9	86.6	
23	2026		135.9	39.2	175.1	88.7	175.1	88.7	
24	2027		153.6	35.2	188.7	92.8	188.7	92.8	
25	2028		164.6	33.5	198.1	94.6	198.1	94.6	
26	2029		188.1	27.7	215.8	100.1	215.8	100.1	
27	2030		197.7	27.7	225.4	101.5	225.4	101.5	
28	2031		206.5	28.7	235.2	102.8	235.2	102.8	
29	2032		215.5	32.9	248.4	105.4	248.4	105.4	
30	2033		224.6	55.6	280.2	115.5	280.2	115.5	
31	2034		232.7	56.5	289.2	115.7	289.2	115.7	
32	2035		242.3	55.5	297.8	115.6	297.8	115.6	
33	2036		250.4	57.1	307.5	115.9	307.5	115.9	
34	2037		258.8	58.7	317.6	116.2	317.6	116.2	
35	2038		267.5	75.6	343.1	121.9	343.1	121.9	
36	2039		284.7	63.4	348.1	120.1	348.1	120.1	
37	2040		293.9	64.4	358.3	120.0	358.3	120.0	
38	2041		303.3	65.5	368.8	119.9	368.8	119.9	
39	2042		316.3	61.3	377.7	119.3	377.7	119.3	
40	2043		326.4	62.5	388.8	119.2	388.8	119.2	
41	2044		336.7	63.6	400.3	119.2	400.3	119.2	
42	2045		362.7	40.3	403.0	116.5	403.0	116.5	
43	2046		373.7	41.5	415.2	116.5	415.2	116.5	
44	2047		385.0	42.8	427.8	116.5	427.8	116.5	
Rate of Return on Equity (nominal)					=	21.6%			
Rate of Return on Equity (real)					=	15.0%			
Net Present Value (at 12% discount rate)					=	46.8 (Mill. US\$)			

Table 12.18 Calculation of Weighted Average Cost of Capital (WACC) for BOTw Scheme

(US\$: US\$ 10⁶)

A. Average Cost of Borrowing							
No.	Year	Loan Drawdown	Debt Service				Net Cash Inflow
			Front-end Fee	Commitment Fee	Interest	Principal Repayment	
1	2004	0.0	0.0	0.0	0.0	0.0	0.0
2	2005	0.0	0.0	0.0	0.0	0.0	0.0
3	2006	0.0	0.0	0.0	0.0	0.0	0.0
4	2007	0.0	0.0	0.0	0.0	0.0	0.0
5	2008	0.0	0.0	0.0	0.0	0.0	0.0
6	2009	0.0	0.0	0.0	0.0	0.0	0.0
7	2010	0.0	0.0	0.0	0.0	0.0	0.0
8	2011	66.4	2.3	1.8	0.0	0.0	-62.3
9	2012	96.7	0.0	1.3	0.0	0.0	-95.4
10	2013	71.4	0.0	0.5	0.0	0.0	-70.9
11	2014	0.0	0.0	0.0	16.7	19.3	36.0
12	2015	19.9	0.9	0.5	15.2	19.3	16.1
13	2016	71.1	0.0	0.0	13.7	19.3	-38.1
14	2017	0.0	0.0	0.0	18.6	26.8	45.5
15	2018	88.4	4.4	3.3	16.6	26.8	-37.2
16	2019	88.6	0.0	2.7	14.5	26.8	-44.6
17	2020	12.5	0.0	2.0	12.5	26.8	28.8
18	2021	121.9	0.0	1.9	10.4	26.8	-82.8
19	2022	133.3	0.0	1.0	8.4	26.8	-97.1
20	2023	0.0	0.0	0.0	38.3	63.7	102.0
21	2024	0.0	0.0	0.0	33.4	52.5	85.9
22	2025	0.0	0.0	0.0	29.6	52.5	82.1
23	2026	0.0	0.0	0.0	25.8	52.5	78.3
24	2027	0.0	0.0	0.0	22.0	48.3	70.3
25	2028	0.0	0.0	0.0	18.6	48.3	67.0
26	2029	0.0	0.0	0.0	15.3	40.1	55.4
27	2030	0.0	0.0	0.0	12.3	40.1	52.4
28	2031	0.0	0.0	0.0	9.3	40.1	49.4
29	2032	0.0	0.0	0.0	6.3	36.9	43.1
30	2033	0.0	0.0	0.0	3.4	15.2	18.6
31	2034	0.0	0.0	0.0	2.7	15.2	17.9
32	2035	0.0	0.0	0.0	2.1	15.2	17.3
33	2036	0.0	0.0	0.0	1.4	15.2	16.6
34	2037	0.0	0.0	0.0	0.7	15.2	15.9
Total		770.2	7.7	15.0	347.6	770.2	
Real Interest Rate (IRR) =					5.9%		
B. Weighted Average Cost of Capital							
					% p.a.	Weight	
Real Cost of Borrowing					5.9%	65.7%	
Rate of Return on Equity (ROE)					15.0%	34.3%	
Weighted Average Cost of Capital					9.0%		

Table 12.19 Examination of Affordability-to-pay for Water after Blending with Angat Wate

Item	Gross Supply (MLD)	NRW		Net Water Supply in 2025 (MLD)	Water Tariff Rate (Pesos/m ³)				
		in 2002	in 2025		Water Supply Costs in 2025 (at 2002 Price)		Tariff Rate at HH in 2025 (at 2002 price)		Tariff Rate in 2025 at 2025 Price
		(%)			At SR	Distribution Cost, etc.	Before NRW Improvement	After NRW Improvement ^{/1}	
1) Tariff Rate of Angat Water in 2025									
i) MWCI	1,700	50%	30%	1,190 (45.9%)			8.5		
ii) MWSI	2,000	66%	30%	1,400 (54.1%)			15.5		
Total	3,700			2,590 (100%)			12.3	6.1	12.1
2) Tariff Rate of Agos Water in 2025	3,000		30%	2,100	15.9	4.6	20.5	29.3	57.8
3) Tariff rate after blending in 2025									
i) Angat Water	3,700	60%	30%	2,590 (55.2%)				6.1	12.1
ii) Agos Water	3,000	-	30%	2,100 (44.8%)				29.3	57.8
Total	6,700			4,690 (100%)				16.5	32.6
4) Share of Water Charge to monthly Family Income in 2025				0.8%					

Notes: 1. /1; It is assumed that the present average NRW ratio of 60% in the Metro Manila service area will be improved to 30% in 2025.

2. Other assumptions made to estimate the above water tariff are as follows:

1) Monthly family income in NCR in 2025 is 115,436 Pesos/month/family.

2) Monthly consumption of water is 30 m³ /month.

3) Inflation rate is 3% p.a.

Table 12.20 Assumptions on Financial Analysis for BOTa Scheme

No.	Item	Amount		Remarks	
		Foreign (Mill. US\$)	Local (M\$)	Total (Mill. US\$)	
1.	Capital Cost (Base Cost)				
	2012			5.4	
	2013			8.5	
	2014			9.8	
	2015			50.9	
	2016			47.5	
	Total			122.0	
2.	Fund Source	Foreign (Mill. US\$)	Local (Mill. US\$)	Total (Mill. US\$)	Repayment period (year)
	Equity			45.1	
	Loan			81.6	
	Commercial Bank			38.1	10
	DFI			43.5	15
	Total			126.6	
3.	Loan Interest Rate				
	Commercial Bank	10.0%			
	DFI	4.5%			
4.	Construction Period	5 years			
5.	Concession period	25 years from operation start			
6.	Tariff	Primary	Secondary		
	Initial tariff (P/kWh)	3.5	3.5		at 2002 prices
	Escalation rate	3.0%	3.0%		
7.	Annual O & M Costs	2.3 (Mill. US\$)			
8.	Depreciation/Amortization	Financial charge	Capital assets		
	Period (years)	5	25		
	Residual value	0%	0%		
	Method	Straight-line	Straight-line		
9.	Debt service reserve	50%		50% of annual debt service	
10.	Initial working capital	50% of annual OM cost in 2022			
11.	Income tax rate	35% from 7th year of operation			
12.	Dividend rate	90% of net profit			
13.	Exchange Rate	52: Peso per US\$			

Table 12.21 Financial Costs (IDC and Financial Charges) for BOTa Scheme

Financial Terms

Source	Interest	Front-end fee	Commitment fee	Repayment period (years)	Share
Commercial loan	10.0%	1.0%	0.75%	10	46.15%
DFI loan	4.5%	1.0%	0.75%	15	53.85%
Total					100%

DFI : Development Financing Institutions

Interests During Construction (IDC)

(Unit: US\$ 10⁶)

Year	2012	2013	2014	2015	2016	Total
Disbursement of Capital Expenditure						
Ratio						
Amount (M\$)	5.4	8.5	9.8	50.9	47.5	122.0
Equity (excl. fees and IWC)						
Ratio						
Amount (M\$)	5.4	8.5	9.8	19.0		42.7
Loan (M\$)						
Commercial Bank						
Disburse				14.7	21.9	36.6
Interest				0.0	1.5	1.5
Total				14.7	23.4	38.1
DFI						
Disburse				17.1	25.6	42.7
Interest				0.0	0.8	0.8
Total				17.1	26.3	43.5
Total Loan (M\$)						
Disburse				31.8	47.5	79.3
Interest				0.0	2.2	2.2
Total				31.8	49.7	81.6
Equity (excl. fees) + Loan	5.4	8.5	9.8	50.9	49.7	124.3
Front-end Fee						
Commercial Bank				0.4		0.4
DFI				0.4		0.4
Total				0.8		0.8
Commitment Fee						
Commercial Bank				0.2	0.0	0.2
DFI				0.2	0.0	0.2
Total				0.4	0.0	0.4
Total of Fees				1.2	0.0	1.2
Initial working capital (IWC)					1.2	1.2
Equity + Loan + Fees + IWC	5.4	8.5	9.8	52.1	50.9	126.6

Equity/(Equity + Loan) ratio = 35.6% (Equity includes financial fees and IWC)

Table 12.22 Projected Cashflow Statement for BOTa Scheme

(Unit: US\$ 10⁶)

Items			Year																										
			2012-2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	
Income Statement	Operating Statement	Operating Revenue	Unit																										
		Energy sales	GWh		318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2	318.2
		Primary	GWh		215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3	215.3
		Secondary	GWh		102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9	102.9
		Power tariff																											
		Primary	P/kWh		5.5	5.6	5.8	6.0	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.8	8.0	8.2	8.5	8.8	9.0	9.3	9.6	9.8	10.1	10.4	10.8	11.1
		Secondary	P/kWh		5.5	5.6	5.8	6.0	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.8	8.0	8.2	8.5	8.8	9.0	9.3	9.6	9.8	10.1	10.4	10.8	11.1
		Operating Revenue	M\$		33.4	45.5	46.8	48.3	49.7	51.2	52.7	54.3	55.9	57.6	59.3	61.1	63.0	64.8	66.8	68.8	70.9	73.0	75.2	77.4	79.8	82.1	84.6	87.1	89.8
		Primary	M\$		22.6	34.4	35.4	36.5	37.6	38.7	39.8	41.0	42.3	43.5	44.8	46.2	47.6	49.0	50.5	52.0	53.5	55.2	56.8	58.5	60.3	62.1	63.9	65.9	67.8
		Secondary	M\$		10.8	11.1	11.4	11.8	12.1	12.5	12.9	13.3	13.7	14.1	14.5	14.9	15.4	15.8	16.3	16.8	17.3	17.8	18.4	18.9	19.5	20.1	20.7	21.3	21.9
	O & M Cost	M\$		2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	
	Amortization (financial fees)	M\$		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	Depreciation (capital assets)	M\$		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
	Total	M\$		7.5	7.5	7.5	7.5	7.5	7.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	Operating Income	M\$		25.9	38.0	39.3	40.7	42.2	43.9	45.5	47.0	48.7	50.3	52.1	53.8	55.7	57.6	59.5	61.5	63.6	65.7	67.9	70.2	72.5	74.9	77.3	79.9	82.5	
Non-Operating Statement	Interest Payment	M\$		5.8	5.3	4.7	4.2	3.7	3.2	2.7	2.2	1.7	1.2	0.7	0.5	0.4	0.3	0.13											
	Commercial Bank	M\$		3.8	3.4	3.0	2.7	2.3	1.9	1.5	1.1	0.8	0.4																
	DFI	M\$		2.0	1.8	1.7	1.6	1.4	1.3	1.2	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.1											
	Short-term interest payment	M\$																											
	Non-operating income	M\$																											
Total	M\$		5.8	5.3	4.7	4.2	3.7	3.2	2.7	2.2	1.7	1.2	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Profit before Tax	M\$		20.1	32.7	34.6	36.5	38.5	40.7	42.8	44.8	47.0	49.2	51.4	53.3	55.3	57.3	59.4	61.5	63.6	65.7	67.9	70.2	72.5	74.9	77.3	79.9	82.5		
Income Tax	M\$								15.0	15.7	16.4	17.2	18.0	18.7	19.4	20.1	20.8	21.5	22.3	23.0	23.8	24.6	25.4	26.2	27.1	28.0	28.9		
Net Profit	M\$		20.1	32.7	34.6	36.5	38.5	40.7	27.8	29.2	30.5	32.0	33.4	34.7	35.9	37.3	38.6	40.0	41.3	42.7	44.1	45.6	47.1	48.7	50.3	51.9	53.6		
Cummulative Net Profit	M\$		20.1	52.8	87.4	123.9	162.4	203.1	230.9	260.0	290.6	322.5	355.9	390.6	426.5	463.8	502.4	542.4	583.7	626.4	670.6	716.2	763.3	811.9	862.2	914.1	967.7		
Fund Statement	Source	Operating Income	M\$	25.9	38.0	39.3	40.7	42.2	43.9	45.5	47.0	48.7	50.3	52.1	53.8	55.7	57.6	59.5	61.5	63.6	65.7	67.9	70.2	72.5	74.9	77.3	79.9	82.5	
		Amortization (financial charge)	M\$	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
		Depriciation (capital assets)	M\$	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
		Non-operating Income	M\$																										
		Loan Capital	M\$	81.6																									
		Equity Capital	M\$	45.1																									
		Total	M\$	126.6	31.1	43.2	44.5	45.9	47.4	48.9	50.4	52.0	53.6	55.3	57.0	58.8	60.7	62.5	64.5	66.5	68.6	70.7	72.9	75.1	77.4	79.8	82.3	84.8	87.5
	Use	Interest Payment	M\$		5.8	5.3	4.7	4.2	3.7	3.2	2.7	2.2	1.7	1.2	0.7	0.5	0.4	0.3	0.1										
		Commercial Bank	M\$		3.8	3.4	3.0	2.7	2.3	1.9	1.5	1.1	0.8	0.4															
		DFI	M\$		2.0	1.8	1.7	1.6	1.4	1.3	1.2	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.1										
		Loan Repayment	M\$		6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
		Commercial Bank	M\$		3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
		DFI	M\$		2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
		Income Tax	M\$								15.0	15.7	16.4	17.2	18.0	18.7	19.4	20.1	20.8	21.5	22.3	23.0	23.8	24.6	25.4	26.2	27.1	28.0	28.9
		Capital Expenditure	M\$	126.6																									
Total	M\$	126.6	12.5	12.0	11.4	10.9	10.4	9.9	24.4	24.6	24.8	25.1	21.5	22.1	22.6	23.2	23.8	21.5	22.3	23.0	23.8	24.6	25.4	26.2	27.1	28.0	28.9		
Cash Surplus	M\$		18.6	31.2	33.1	35.0	37.0	39.0	26.1	27.4	28.8	30.2	35.5	36.7	38.0	39.3	40.7	45.0	46.3	47.7	49.1	50.6	52.1	53.6	55.2	56.9	58.6		
Cummulative Cash Surplus	M\$		18.6	49.8	82.9	117.9	154.9	193.8	219.9	247.3	276.1	306.3	341.8	378.6	416.6	455.9	496.6	541.5	587.8	635.5	684.6	735.2	787.3	840.9	896.2	953.1	1011.6		
Debt Service Reserve Account	M\$		6.2	6.0	5.7	5.5	5.2	5.0	4.7	4.4	4.2	3.9	1.8	1.7	1.6	1.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Dividend Payment	M\$		12.4	25.2	27.4	29.5	31.8	34.0	21.4	23.0	24.6	26.3	30.1	31.2	32.3	33.5	34.7	36.0	37.2	38.4	39.7	41.0	42.4	43.8	45.2	46.7	48.3		
Cummulative Dividend Payment	M\$		12.4	37.6	65.0	94.5	126.3	160.3	181.6	204.6	229.2	255.5	285.6	316.8	349.1	382.6	417.4	453.4	490.6	529.0	568.7	609.8	652.2	696.0	741.2	787.9	836.2		
Cash Surplus after Dividend Payment	M\$		6.2	6.0	5.7	5.5	5.2	5.0	4.7	4.4	4.2	3.9	5.4	5.5	5.7	5.8	5.9	9.0	9.1	9.2	9.4	9.5	9.7	9.8	10.0	10.2	10.3		
Debt Service Cover Ratio (DSCR)	times		2.5	3.6	3.9	4.2	4.5	4.9	3.8	4.1	4.4	4.8	11.0	11.7	12.6	13.4	14.4												

Table 12.25 Calculation of Weighted Average Cost of Capital (WACC) for BOTa Scheme

(Unit: US\$ 10⁶)

A. Average Cost of Borrowing						
Year	Loan Drawdown	Debt Service				Net Cash Inflow
		Front-end Fee	Commitment Fee	Interest	Principal Repayment	
2012				0.0	0.0	0.0
2013				0.0	0.0	0.0
2014				0.0	0.0	0.0
2015	31.8	0.8	0.4	0.0	0.0	-30.7
2016	49.7		0.0	0.0	0.0	-49.7
2017				5.8	6.7	12.5
2018				5.3	6.7	12.0
2019				4.7	6.7	11.4
2020				4.2	6.7	10.9
2021				3.7	6.7	10.4
2022				3.2	6.7	9.9
2023				2.7	6.7	9.4
2024				2.2	6.7	8.9
2025				1.7	6.7	8.4
2026				1.2	6.7	7.9
2027				0.7	2.9	3.6
2028				0.5	2.9	3.4
2029				0.4	2.9	3.3
2030				0.3	2.9	3.2
2031				0.1	2.9	3.0
2032						0.0
2033						0.0
2034						0.0
2035						0.0
2036						0.0
2037						0.0
2038						0.0
2039						0.0
2040						0.0
2041						0.0
Total		0.8	0.4	36.6	81.6	119.4
Real Interest Rate				=	6.5%	
B. Weighted Average Cost of Capital						
				<u>% p.a.</u>	<u>Weight</u>	
	Real Cost of Borrowing			6.5%	64.4%	
	Rate of Return on Equity (real)			38.4%	35.6%	
	Weighted Average Cost of Capital			17.9%		

Table 12.26 Computation of EIRR for GOVw + BOTw Schemes Stage 1

(Unit: US\$ 10⁶)

No.	Year	Capital/Replacement Cost			Operation and Maintenance Cost					Total Cost	Water Supply in Stage 1	NRW (%)	Economic Benefit			B - C
		Project Facilities	Distribution Main	Subtotal	Project Facilities	Distribution costs (1)	Coastal Prevention	Land slide Prevention	Subtotal				Water Supply	External Benefit	Total Benefit	
1	2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.3	0.0	0.0	0.0	0.0	
2	2005	4.1	0.0	4.1	0.0	0.0	0.0	0.0	4.1	4.1	54.0	0.0	0.0	0.0	-4.1	
3	2006	5.8	0.0	5.8	0.0	0.0	0.0	0.0	5.8	5.8	52.7	0.0	0.0	0.0	-5.8	
4	2007	7.0	0.0	7.0	0.0	0.0	0.0	0.0	7.0	7.0	51.5	0.0	0.0	0.0	-7.0	
5	2008	7.0	0.0	7.0	0.0	0.0	0.0	0.0	7.0	7.0	50.3	0.0	0.0	0.0	-7.0	
6	2009	55.4	0.0	55.4	0.0	0.0	0.0	0.0	55.4	55.4	49.1	0.0	0.0	0.0	-55.4	
7	2010	99.4	0.0	99.4	0.0	0.0	0.0	0.0	99.4	99.4	48.0	0.0	0.0	0.0	-99.4	
8	2011	112.6	71.4	183.9	0.0	0.0	0.0	0.0	183.9	183.9	46.7	0.0	0.0	0.0	-183.9	
9	2012	113.0	71.4	184.4	0.0	0.0	0.0	0.0	184.4	184.4	45.5	0.0	0.0	0.0	-184.4	
10	2013	69.7	11.2	80.8	0.0	0.0	0.0	0.0	80.8	80.8	44.3	0.0	0.0	0.0	-80.8	
11	2014	0.0	11.2	11.2	3.8	19.6	0.0	0.0	23.4	34.6	620.0	43.1	94.3	64.4	158.8	124.2
12	2015	0.0	11.2	11.2	3.8	19.6	0.0	0.0	23.4	34.6	620.0	42.0	96.2	64.5	160.7	126.1
13	2016	0.0	4.1	4.1	3.8	19.6	0.0	0.0	23.4	27.6	620.0	40.7	98.3	65.5	163.8	136.2
14	2017	0.0	2.2	2.2	7.7	44.1	0.0	0.0	27.9	30.1	750.0	39.5	121.4	35.8	157.3	127.1
15	2018	0.0	2.1	2.1	7.7	47.5	0.0	3.0	29.1	31.2	750.0	38.3	123.8	33.7	157.6	126.4
16	2019	0.0	2.1	2.1	7.7	47.5	0.0	3.0	29.1	31.2	750.0	37.1	126.2	34.2	160.4	129.2
17	2020	0.0	4.8	4.8	8.5	59.9	0.0	3.0	28.3	33.1	750.0	36.0	128.4	27.6	156.0	122.9
18	2021	0.0	4.3	4.3	8.5	66.9	0.0	3.0	27.8	32.2	750.0	34.7	131.0	25.0	156.1	123.9
19	2022	0.0	4.1	4.1	8.5	71.3	8.4	3.0	30.4	34.4	750.0	33.5	133.5	23.9	157.4	122.9
20	2023	0.0	3.6	3.6	12.7	81.0	0.0	3.0	28.4	31.9	750.0	32.3	135.9	21.3	157.2	125.3
21	2024	0.0	3.3	3.3	12.7	88.1	0.0	3.0	28.0	31.3	750.0	31.1	138.2	19.9	158.1	126.9
22	2025	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
23	2026	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
24	2027	0.0	0.0	0.0	12.7	95.0	9.5	3.0	30.1	30.1	750.0	30.0	140.5	18.7	159.2	129.1
25	2028	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
26	2029	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
27	2030	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
28	2031	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
29	2032	0.0	19.3	19.3	12.7	95.0	10.8	3.0	30.4	49.7	750.0	30.0	140.5	18.7	159.2	109.5
30	2033	65.7	0.0	65.7	12.7	95.0	0.0	3.0	27.7	93.3	750.0	30.0	140.5	18.7	159.2	65.9
31	2034	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
32	2035	0.0	4.5	4.5	12.7	95.0	0.0	3.0	27.7	32.2	750.0	30.0	140.5	18.7	159.2	127.0
33	2036	0.0	0.0	0.0	12.7	95.0	0.0	3.0	27.7	27.7	750.0	30.0	140.5	18.7	159.2	131.5
34	2037	0.0	0.0	0.0	12.7	95.0	12.3	3.0	30.8	30.8	750.0	30.0	140.5	18.7	159.2	128.5
35	2038	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
36	2039	0.0	2.2	2.2	12.7	95.0	0.0	0.0	26.9	29.2	750.0	30.0	140.5	18.7	159.2	130.0
37	2040	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
38	2041	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
39	2042	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
40	2043	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
41	2044	0.0	8.2	8.2	12.7	95.0	0.0	0.0	26.9	35.1	750.0	30.0	140.5	18.7	159.2	124.1
42	2045	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
43	2046	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
44	2047	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
45	2048	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
46	2049	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
47	2050	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
48	2051	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
49	2052	65.7	0.0	65.7	12.7	95.0	0.0	0.0	26.9	92.6	750.0	30.0	140.5	18.7	159.2	66.6
50	2053	0.0	0.0	0.0	12.7	95.0	0.0	0.0	26.9	26.9	750.0	30.0	140.5	18.7	159.2	132.3
NPV (12%) =		199.8	69.7	269.6	22.4	153.5	2.3	4.6	71.5	341.0	1,890.2		324.9	97.2	422.0	
Total =		605.1													EIRR =	15.0%
															B/C(12%)=	1.2

Note: (1) Costs for water distribution including primary distribution mains.

Table 12.27 Projected Cashflow Statement of BOTw Scheme Stage 1

Item	Year	2005-2033																																				
		2005-2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047		
Income Statement	Revenue	Water sales	MLD	620.0	620.0	620.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0
		St. 1	MLD	620.0	620.0	620.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0
		St. 2-1	MLD				641.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0	750.0
		St. 2-2	MLD																																			
		Water tariff	P/sum		25.3	26.0	26.8	27.6	28.4	29.3	30.2	31.1	32.0	33.0	34.0	35.0	36.0	37.1	38.2	39.4	40.5	41.8	43.0	44.3	45.6	47.0	48.4	49.9	51.4	52.9	54.5	56.1	57.8	59.5	61.3	63.2	65.1	67.0
		Operating Revenue	MS		107.8	111.0	114.3	142.4	146.7	151.1	155.6	160.3	165.1	170.1	175.2	180.4	185.8	191.4	197.2	203.1	209.2	215.4	221.9	228.6	235.4	242.5	249.8	257.2	265.0	272.9	281.1	289.5	298.2	307.2	316.4	325.9	335.6	345.7
	St. 1	MS		107.8	111.0	114.3	142.4	146.7	151.1	155.6	160.3	165.1	170.1	175.2	180.4	185.8	191.4	197.2	203.1	209.2	215.4	221.9	228.6	235.4	242.5	249.8	257.2	265.0	272.9	281.1	289.5	298.2	307.2	316.4	325.9	335.6	345.7	
	St. 2-1	MS																																				
	St. 2-2	MS																																				
	GOVw purchase	MS	Accumulated	44.7	46.1	47.5	99.4	111.3	114.6	162.9	187.5	205.7	240.9	269.7	299.7	308.7	317.9	327.5	337.3	347.4	357.8	368.6	379.6	391.0	402.8	414.8	427.3	440.1	453.3	466.9	480.9	495.3	510.2	525.5	541.3	557.5	574.2	
	St. 1	MS	Accumulated	44.9	46.2	47.6	49.0	50.5	52.0	64.8	66.7	68.7	70.8	72.9	75.1	77.4	79.7	82.1	84.5	87.1	89.7	92.4	95.1	98.0	100.9	104.0	107.1	110.3	113.6	117.0	120.5	124.1	127.9	131.7	135.7	139.7	143.9	
	St. 2-1	MS	Accumulated	114.8	118.3	121.8	255.2	285.6	294.2	331.8	341.7	352.0	362.5	373.4	384.6	396.1	408.0	420.3	432.9	445.9	459.2	473.0	487.2	501.8	516.9	532.4	548.4	564.8	581.8	599.2	617.2	635.7	654.8	674.4	694.6	715.5	737.0	
	St. 2-2	MS	Accumulated	44.7	46.1	47.5	99.4	111.3	114.6	162.9	187.5	205.7	240.9	269.7	299.7	308.7	317.9	327.5	337.3	347.4	357.8	368.6	379.6	391.0	402.8	414.8	427.3	440.1	453.3	466.9	480.9	495.3	510.2	525.5	541.3	557.5	574.2	
	O & M Cost	MS		1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	St. 1	MS		1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	St. 2-1	MS		1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	St. 2-2	MS																																				
	Amortization (financial fees)	MS		1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	St. 1	MS		1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	St. 2-1	MS																																				
St. 2-2	MS																																					
Depreciation (capital assets)	MS		14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1		
St. 1	MS		14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1		
St. 2-1	MS																																					
St. 2-2	MS																																					
Total	MS		61.8	63.1	64.5	65.9	67.4	67.8	80.6	82.5	84.5	86.6	88.7	90.9	93.2	95.5	97.9	100.3	102.9	105.5	108.2	110.9	113.8	116.7	119.8	122.9	126.1	115.3	118.7	122.2	125.8	129.6	133.4	137.4	141.4	145.6		
Operating Income	MS		45.9	47.8	49.8	76.5	79.3	83.3	75.1	77.8	80.7	83.5	86.5	89.6	92.7	96.0	99.3	102.8	106.3	110.0	113.7	117.7	121.7	125.8	130.0	134.4	138.9	157.6	162.4	167.4	172.4	177.6	183.0	188.5	194.3	200.1		
Non-Operating Statement	Interest Payment (by Stage)	MS	16.7	15.2	13.7	12.2	10.7	9.3	7.8	6.3	4.8	3.3	1.8	1.5	1.1	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	H46	MS	5.5	5.2	4.8	4.4	4.1	3.7	3.3	3.0	2.6	2.2	1.8	1.5	1.1	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	DFI loan	MS	11.1	10.0	8.9	7.8	6.7	5.6	4.5	3.3	2.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Commercial bank	MS																																				
	Total	MS	16.7	15.2	13.7	12.2	10.7	9.3	7.8	6.3	4.8	3.3	1.8	1.5	1.1	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Profit before Tax	MS		29.2	32.6	36.1	64.3	68.5	74.1	67.3	71.5	75.8	80.2	84.7	88.1	91.6	95.2	98.9	102.8	106.3	110.0	113.7	117.7	121.7	125.8	130.0	134.4	138.9	157.6	162.4	167.4	172.4	177.6	183.0	188.5	194.3	200.1		
Income Tax	MS								23.6	25.0	26.5	28.1	29.6	30.8	32.0	33.3	34.6	36.0	37.2	38.5	39.8	41.2	42.6	44.0	45.5	47.0	48.6	55.2	56.8	58.6	60.4	62.2	64.0	66.0	68.0	70.0		
Net Profit	MS		29.2	32.6	36.1	64.3	68.5	74.1	43.7	46.5	49.3	52.1	55.0	57.3	59.5	61.9	64.3	66.8	69.1	71.5	73.9	76.5	79.1	81.8	84.5	87.3	90.3	102.5	105.6	108.8	112.1	115.4	118.9	122.5	126.3	130.1		
Cummulative Net Profit	MS		29.2	61.9	97.9	162.2	230.7	304.8	348.5	395.0	444.3	496.5	551.5	608.8	668.3	730.2	794.5	861.3	930.4	1,001.9	1,075.8	1,152.3	1,231.4	1,313.2	1,397.7	1,485.0	1,575.3	1,677.8	1,783.3	1,892.1	2,004.2	2,119.6	2,238.6	2,361.1	2,487.4	2,614.9		
Source	Operating Income	MS																																				

Table 12.28 Calculation of FIRR for GOVw + BOTw Schemes Stage 1

No.	Year	Capital Cost (Mill. US\$)	Initial Working Capital (Mill. US\$)	O & M Cost (Mill. US\$)	Raw Water Purchase GOVw (Mill. US\$)	Total Costs BOTw (Mill. US\$)	Total Water Supply (MLD)	Water Tariff (P/cum)	Operating Revenue (Mill. US\$)	Income Tax (Mill. US\$)	Internal Cash Generation (Mill. US\$)	Net Benefits (Mill. US\$)
1	2004					0.0						0.0
2	2005	0.6				0.6						-0.6
3	2006	0.9				0.9						-0.9
4	2007	0.9				0.9						-0.9
5	2008	0.9				0.9						-0.9
6	2009	31.0				31.0						-31.0
7	2010	61.7				61.7						-61.7
8	2011	87.9				87.9						-87.9
9	2012	92.0				92.0						-92.0
10	2013	59.9	0.8			60.7						-60.7
11	2014			1.7	44.9	46.6	620.0	25.3	107.8		107.8	61.2
12	2015			1.7	46.2	47.9	620.0	26.0	111.0		111.0	63.1
13	2016			1.7	47.6	49.3	620.0	26.8	114.3		114.3	65.0
14	2017			1.7	49.0	50.7	750.0	27.6	142.4		142.4	91.8
15	2018			1.7	50.5	52.2	750.0	28.4	146.7		146.7	94.5
16	2019			1.7	52.0	53.7	750.0	29.3	151.1		151.1	97.4
17	2020			1.7	64.8	66.5	750.0	30.2	155.6	23.6	132.1	65.6
18	2021			1.7	66.7	68.4	750.0	31.1	160.3	25.0	135.3	66.9
19	2022			1.7	68.7	70.4	750.0	32.0	165.1	26.5	138.6	68.2
20	2023			1.7	70.8	72.5	750.0	33.0	170.1	28.1	142.0	69.5
21	2024			1.7	72.9	74.6	750.0	34.0	175.2	29.6	145.5	71.0
22	2025			1.7	75.1	76.8	750.0	35.0	180.4	30.8	149.6	72.8
23	2026			1.7	77.4	79.1	750.0	36.0	185.8	32.0	153.8	74.7
24	2027			1.7	79.7	81.4	750.0	37.1	191.4	33.3	158.1	76.7
25	2028			1.7	82.1	83.8	750.0	38.2	197.2	34.6	162.5	78.8
26	2029			1.7	84.5	86.2	750.0	39.4	203.1	36.0	167.1	80.9
27	2030			1.7	87.1	88.8	750.0	40.5	209.2	37.2	172.0	83.2
28	2031			1.7	89.7	91.4	750.0	41.8	215.4	38.5	176.9	85.6
29	2032			1.7	92.4	94.1	750.0	43.0	221.9	39.8	182.1	88.0
30	2033			1.7	95.1	96.8	750.0	44.3	228.6	41.2	187.4	90.6
31	2034			1.7	98.0	99.7	750.0	45.6	235.4	42.6	192.8	93.2
32	2035			1.7	100.9	102.6	750.0	47.0	242.5	44.0	198.4	95.9
33	2036			1.7	104.0	105.7	750.0	48.4	249.8	45.5	204.3	98.6
34	2037			1.7	107.1	108.8	750.0	49.9	257.2	47.0	210.2	101.4
35	2038			1.7	110.3	112.0	750.0	51.4	265.0	48.6	216.3	104.4
36	2039			1.7	113.6	115.3	750.0	52.9	272.9	55.2	217.7	102.5
37	2040			1.7	117.0	118.7	750.0	54.5	281.1	56.8	224.3	105.6
38	2041			1.7	120.5	122.2	750.0	56.1	289.5	58.6	231.0	108.8
39	2042			1.7	124.1	125.8	750.0	57.8	298.2	60.4	237.9	112.1
40	2043			1.7	127.9	129.6	750.0	59.5	307.2	62.2	245.0	115.4
41	2044			1.7	131.7	133.4	750.0	61.3	316.4	64.0	252.3	118.9
42	2045			1.7	135.7	137.4	750.0	63.2	325.9	66.0	259.9	122.5
43	2046			1.7	139.7	141.4	750.0	65.1	335.6	68.0	267.7	126.3
44	2047			1.7	143.9	145.6	750.0	67.0	345.7	70.0	275.7	130.1
Financial Internal Rate of Return									=	16.6%		
Net Present Value (at 12% discount rate)									=	69.00 (Million US\$)		

Table 12.29 Calculation of Return on Equity (ROE) for BOTw Scheme Stage 1

(Unit: US\$ 10⁶)

No.	Year	Equity Capital	Dividend (nominal)	Cash Surplus (nominal)	Total Income		Net Benefits	
					(nominal)	(real)	(nominal)	(real)
1	2004				0.0	0.0	0.0	0.0
2	2005	0.6			0.0	0.0	-0.6	-0.6
3	2006	0.9			0.0	0.0	-0.9	-0.9
4	2007	0.9			0.0	0.0	-0.9	-0.9
5	2008	0.9			0.0	0.0	-0.9	-0.9
6	2009	31.0			0.0	0.0	-31.0	-31.0
7	2010	61.7			0.0	0.0	-61.7	-61.7
8	2011	25.6			0.0	0.0	-25.6	-25.6
9	2012	1.3			0.0	0.0	-1.3	-1.3
10	2013	1.4			0.0	0.0	-1.4	-1.4
11	2014		7.1	18.0	25.1	18.2	25.1	18.2
12	2015		11.3	17.3	28.6	20.0	28.6	20.0
13	2016		15.4	16.5	32.0	21.8	32.0	21.8
14	2017		44.4	15.8	60.2	39.8	60.2	39.8
15	2018		49.4	15.0	64.4	41.4	64.4	41.4
16	2019		54.5	14.3	68.8	42.9	68.8	42.9
17	2020		24.9	13.6	38.5	23.3	38.5	23.3
18	2021		28.4	12.8	41.2	24.2	41.2	24.2
19	2022		32.0	12.1	44.0	25.1	44.0	25.1
20	2023		35.5	11.3	46.9	25.9	46.9	25.9
21	2024		49.5	11.4	60.9	32.7	60.9	32.7
22	2025		51.5	11.6	63.1	32.9	63.1	32.9
23	2026		53.6	11.8	65.4	33.1	65.4	33.1
24	2027		55.7	12.1	67.8	33.3	67.8	33.3
25	2028		57.9	12.3	70.2	33.5	70.2	33.5
26	2029		60.1	20.8	80.9	37.5	80.9	37.5
27	2030		62.2	21.0	83.2	37.4	83.2	37.4
28	2031		64.3	21.2	85.6	37.4	85.6	37.4
29	2032		66.5	21.5	88.0	37.3	88.0	37.3
30	2033		68.9	21.7	90.6	37.3	90.6	37.3
31	2034		71.2	22.0	93.2	37.3	93.2	37.3
32	2035		73.6	22.3	95.9	37.2	95.9	37.2
33	2036		76.0	22.5	98.6	37.2	98.6	37.2
34	2037		78.6	22.8	101.4	37.1	101.4	37.1
35	2038		81.3	23.1	104.4	37.1	104.4	37.1
36	2039		92.2	10.2	102.5	35.4	102.5	35.4
37	2040		95.0	10.6	105.6	35.4	105.6	35.4
38	2041		97.9	10.9	108.8	35.4	108.8	35.4
39	2042		100.9	11.2	112.1	35.4	112.1	35.4
40	2043		103.9	11.5	115.4	35.4	115.4	35.4
41	2044		107.1	11.9	118.9	35.4	118.9	35.4
42	2045		110.3	12.3	122.5	35.4	122.5	35.4
43	2046		113.6	12.6	126.3	35.4	126.3	35.4
44	2047		117.1	13.0	130.1	35.4	130.1	35.4
					Rate of Return on Equity (nominal)		= 20.6%	
					Rate of Return on Equity (real)		= 14.998%	
					Net Present Value (at 12% discount rate)		= 24.0 (Million US\$)	

Table 12.30 Weighted Average Cost of Capital (WACC) for BOTw Scheme Stage 1

(Unit: US\$ 10⁶)

A. Average Cost of Borrowing							
No.	Year	Loan Drawdown	Debt Service				Net Cash Inflow
			Front-end Fee	Commitment Fee	Interest	Principal Repayment	
1	2004	0.0	0.0	0.0	0.0	0.0	0.0
2	2005	0.0	0.0	0.0	0.0	0.0	0.0
3	2006	0.0	0.0	0.0	0.0	0.0	0.0
4	2007	0.0	0.0	0.0	0.0	0.0	0.0
5	2008	0.0	0.0	0.0	0.0	0.0	0.0
6	2009	0.0	0.0	0.0	0.0	0.0	0.0
7	2010	0.0	0.0	0.0	0.0	0.0	0.0
8	2011	66.4	2.3	1.8	0.0	0.0	-62.3
9	2012	96.7	0.0	1.3	0.0	0.0	-95.4
10	2013	71.4	0.0	0.5	0.0	0.0	-70.9
11	2014	0.0	0.0	0.0	16.7	19.3	36.0
12	2015	0.0	0.0	0.0	15.2	19.3	34.5
13	2016	0.0	0.0	0.0	13.7	19.3	33.1
14	2017	0.0	0.0	0.0	12.2	19.3	31.6
15	2018	0.0	0.0	0.0	10.7	19.3	30.1
16	2019	0.0	0.0	0.0	9.3	19.3	28.6
17	2020	0.0	0.0	0.0	7.8	19.3	27.1
18	2021	0.0	0.0	0.0	6.3	19.3	25.6
19	2022	0.0	0.0	0.0	4.8	19.3	24.2
20	2023	0.0	0.0	0.0	3.3	19.3	22.7
21	2024	0.0	0.0	0.0	1.8	8.2	10.0
22	2025	0.0	0.0	0.0	1.5	8.2	9.7
23	2026	0.0	0.0	0.0	1.1	8.2	9.3
24	2027	0.0	0.0	0.0	0.7	8.2	8.9
25	2028	0.0	0.0	0.0	0.4	8.2	8.6
26	2029	0.0	0.0	0.0	0.0	0.0	0.0
27	2030	0.0	0.0	0.0	0.0	0.0	0.0
28	2031	0.0	0.0	0.0	0.0	0.0	0.0
29	2032	0.0	0.0	0.0	0.0	0.0	0.0
30	2033	0.0	0.0	0.0	0.0	0.0	0.0
31	2034	0.0	0.0	0.0	0.0	0.0	0.0
32	2035	0.0	0.0	0.0	0.0	0.0	0.0
33	2036	0.0	0.0	0.0	0.0	0.0	0.0
34	2037	0.0	0.0	0.0	0.0	0.0	0.0
Total		234.5	2.3	3.6	105.6	234.5	
Real Interest Rate (IRR) = 6.1%							
B. Weighted Average Cost of Capital							
					% p.a.	Weight	
					6.1%	65.7%	
					15.0%	34.3%	
					9.1%		

CHAPTER XIII RECOMMENDATIONS OF FURTHER ACTIONS IN SUBSEQUENT STAGES

13.1 General

As stated in the earlier Chapters, the proposed Kaliwa Low Dam-Agos project would need the earliest commissioning, since the demand-supply gap is projected to be in a serious condition within several years. This requires a quick mobilization of the project for moving to the implementation stage. On one hand, this Study identified some technical aspects to be further refined in the subsequent stages particularly during the detailed design stage. All of them are of technically solvable nature. Focusing on these aspects, this Chapter briefly describes the major items of actions to be taken by the Executing Agency (MWSS) for the forthcoming period.

13.2 Decision of the Implementation

Utmost importance is the earliest completion of the project as stated above. For this purpose, MWSS shall decide the implementation of the proposed project at the earliest possible time.

There are two other development options as described in Section 12.6 before. However, overall comparison has indicated that the proposed project should be given the priority.

13.3 Actions towards the Implementation

Once the decision of the implementation is made, MWSS shall commence the activities for mobilizing the project, initiated by dialogue with the project-affected people for solving the relocation issue as early as possible. The other activities needing immediate commencement are described in Section 11.5 before.

13.4 Technical Aspects to be Further Examined

There are some technical aspects that could have not been fully detailed in this Feasibility Study stage, owing mainly to the limited quantities of field investigation works and the lack of existing data made available at the present stage. These items should be refined during the detailed design stage. Table 13.1 summarizes the major items needing the further investigations and studies.

13.5 Decision on Issues raised at Public Consultations/Workshops

Various opinions were expressed at the places of three public consultations held as a part of EIA survey programs and two workshops held at the end phase of the Study. Table 13.2 summarizes the proposed responses to the public opinions raised at the workshops.

The final decision on the raised issues should be given in line with the policy of the MWSS as well as the Government. Hence, MWSS shall review the concepts suggested in the Table and determine the policies for each item. The decision shall be reached before the commencement of dialogue with local people and LGUs.

Table 13.1 Technical Aspects to be Further Detailed in Subsequent Stage (1/2)

Item	Description
Topographic Survey:	
Agos Reservoir Area	<ul style="list-style-type: none"> - Conduct a new aerial-photography for the Agos reservoir area to confirm the latest condition of the reservoir area. (Note: F/S could not accomplish air-photo shooting for the reservoir area due to unfavorable weather condition prevailed during the investigation period)
Hydrology:	
Runoff Analysis	<ul style="list-style-type: none"> - Update the runoff analysis incorporating the latest runoff records observed at new stream gauging stations (4 stations established under this F/S)
Damsite Geology:	
Assumed Faults	<ul style="list-style-type: none"> - Investigate in detail the exact alignment and in-situ conditions of 4 faults (low velocity zones) identified in the F/S
Riverbed Deposit	<ul style="list-style-type: none"> - Investigate the riverbed deposit depths to confirm the dam foundation rock levels - Acquire more in-situ data for assessing the strength and permeability of the riverbed deposit layers
Landslide	<ul style="list-style-type: none"> - Investigate in detail potential landslide blocks, covering both the damsite and reservoir area (by combination of reconnaissance, drilling investigation, seismic refraction survey and in-situ measurements as required)
Coastal Investigation:	
Impact to Coast	<ul style="list-style-type: none"> - Collect in-situ observed data, such as wave condition, coast topography, properties of coast and riverbed sands, and conduct a detailed analysis of sand transport along the coast
Agos Dam:	
Design for Seismicity	<ul style="list-style-type: none"> - Confirm the stability of dam structures against seismicity risks in view of its proximity to Infanta Active Fault. The analysis shall take into account the seismic waves actually observed at the Infanta Fault.
Dam Foundation Design	<ul style="list-style-type: none"> - Confirm the appropriateness of dam foundation design, particularly with regard to the use of river deposit layer as the foundation, based on detailed in-situ data collected by supplemental investigation. The analysis includes the assessment of strengths, consolidation and deformation during earthquake.
Spillway Flip Bucket	<ul style="list-style-type: none"> - Present design proposes a flip-bucket structure with an excavated energy-dissipating basin at the end of chute. The subsequent design shall examine the required width, length and depth of the basin through a hydraulic model test. Also, ensure the stability of excavated slopes in and above the basin. - Examine the stability of water surfaces by the same hydraulic model test so that adverse effect does not reach the powerhouse tailrace by.

(Continue)

Note: The above itemizes only major items particular to the proposed project and does not state such items as normally covered by detailed design.

Table 13.1 Technical Aspects to be Further Detailed in Subsequent Stage (2/2)

Item	Description
Waterway Layout:	
Kaliwa Low Dam	- Investigate the possibility of building Kaliwa Low Dam at Alternative No.1 site by clarifying in detail the distribution of faults and limestone blocks in the vicinity and also sedimentation behavior in the pond of the dam. This plan, if found feasible, could shorten the waterway length by about 2.5 km, amounting roughly US\$ 12 million in terms of reducible cost .(See Annex G for detail)
Fault on the Route of Tunnel No.1	- Investigate the exact location of a major fault (designated as active fault by PHILVOLCS) occurring at 24-km point of Tunnel No.1, and confirm the tunnel to cross the fault at right angle. (See Annex G for detail)
Tunnel No.2 Inlet Site	- Seek a possibility of setting out the inlet at the foot of limestone hill located north to the presently proposed waterway route. This can reduce the number of household relocations at the inlet site. (See Annex G for detail)
O&M Facilities:	
Facilities and Equipment for Operation and Maintenance	- Examine the detailed features of facilities and equipment for facilitating the operation and maintenance works, which include the facilities for dam operation (computer system, water level recorder, rainfall gauge, flow release alarm system, etc.), spare equipment (such as gate and stoplogs) inspection and patrol facilities, and telecommunication facilities.

Note: The above itemizes only major items particular to the proposed project and does not state such items as normally covered by detailed design.

Table 13.2 Proposed Responses to Issues Raised at Workshops (1/5)

First Workshop held at Pililla on October 9, 2002 (1/3)

Issues/Questions		Comments/Recommendations Raised by People/LGUs	Proposed Response (by This Study)
A. AGOS DAM AND RESERVOIR			
A1. On Project Features and Proposed Structures			
1	Need for an intensive information campaign to disseminate the project to all affected people	A continuing information, education and communication (IEC) should be pursued using tri-media approaches and by holding more public hearing and consultation activities at barangay and municipal levels.	Executing Agency will duly take this aspect into consideration.
2	Formulation of Relocation Plan (RP)	<ul style="list-style-type: none"> - To formulate an effective RP taking into consideration the town's opinions - Comprehensive Land Use Plan (CLUP) and Zoning Ordinances as well as the different Proclamations (#1636, 7586 & 196) that govern the land use of the watershed - Basic services should be provided in the relocation site - Site should be accessible and near their means of livelihood/alternative livelihood 	Executing Agency will duly take these aspects into consideration in preparing the RP.
3	Dam stability	<ul style="list-style-type: none"> - Proper designing - To draw up an effective monitoring system during construction with LGU participation - Proper dam management 	Executing Agency will duly take this aspect into consideration. The dam will be designed to be safe against all probable risks.
4	Planning of hydropower facilities	To consult with concerned agencies on the long-term energy requirements for Metro-Reina area Note: Reina: Real-Infanta-General Nakar	Proposed Agos power plant has a capacity capable of meeting power demand in Metro-Reina area for a foreseeable future (See Annex H).
5	Need for erosion control facilities	Construction of erosion control dykes along Infanta and General Nakar	The project itself would give no adverse effect to the erosion issue. Nevertheless, in view of seriousness of the problem, the project will consider the works as a program for coordination with the local area.
6	Need for municipal water supply systems in Infanta and General Nakar	To consider provision of water supply system in the two towns	The proposed works shall be undertaken under a separate program, since they are of the nature not directly related to the project.
7	Need for road improvement to affected areas	Provision and improvement of access roads to dam and affected communities	The project will improve access roads to dam and also provide new roads to resettlement sites.
8	Downstream water requirement	To provide sufficient irrigation water requirement and necessary river training, dredging and diversion works	Maximum potential irrigation water demand is estimated as 4.5 m ³ /sec. This will be ensured by release from the Agos Dam. Immediate need is bank erosion control work. Other river improvement works should better be deemed as the future subjects to be planned after the river course becomes in a stable regime.

(Continue)

Table 13.2 Proposed Responses to Issues Raised at Workshops (2/5)

First Workshop held at Pililla on October 9, 2002 (2/3)

Issues/Questions		Comments/Recommendations Raise by People/LGUs	Proposed Response (by This Study)
A2. On Natural, Social, Economic and Institutional Aspects			
1	Economic revenue for the host municipalities from 'structural taxes' and national wealth share	<ul style="list-style-type: none"> - Review and research on existing policies/laws, if none, there should be a body to initiate formulation of such policies/laws - Formulation of such policies in close coordination with concerned agencies/LGUs 	Executing Agency will look into existing laws to judge whether the concept of 'structural tax' could be introduced. An alternative measure is to establish 'Agos Water Resources Development Fund', where the required fund will be deposited from water revenue of GOVw. This is also subject to further review referring to the existing laws.
2	Social acceptability	This should be a 'win-win' solution.	Executing Agency will follow this principle.
3	Siltation effect	Provide measures to mitigate siltation in order to protect fish sanctuary	Construction works will take necessary measures to minimize the effluence of silts into the river.
4	Indigenous People concern	Strict compliance on the provision of Free and Prior Consent and Indigenous People's Rights Act (RA8371)	Executing Agency will follow these basic principles.
5	Need for watershed protection	<ul style="list-style-type: none"> - Should not be the site for relocation - Watershed program should be coordinated closely with Multi-sectoral Watershed Management Council - Assigning forest guards - Intensive forestation 	Executing Agency will duly respect these basic principles and coordinate with the concerned agencies/LGUs.
6	Environmental Compliance Certificate (ECC) requirement before start of construction	<ul style="list-style-type: none"> - Consensus of barangays, municipalities through resolutions - MOA/MOU with various concerned agencies, e.g., environmental guarantee funds, monitoring funds 	Executing Agency will duly take these aspects into consideration in acquiring the ECC.
7	Lessons learnt from Laiban Project	Close coordination with concerned agencies and respective LGUs	Executing Agency will have close coordination with other agencies in proceeding with the implementation.
W. WATERWAY FACILITIES			
W1. On Project Features and Proposed Structures			
1	Resettlement	Provide relocation site with livelihood component	Resettlement Plan (RP) will duly take into account this issue.
2	Right of Way (ROW)	Provision of sufficient funding/compensation for ROW, both for under and above-ground structures	ROW will duly take into account this issue.
3	Presence of fault lines	Proper seismic evaluation for consideration on the structure design	Structure design will duly take into account this aspect.
4	Extension of water supply to Rizal	Provision of water supply lines to the eastern part of Rizal from WTP	The project envisages extending its supply area to eastern part of Rizal. In the initial period, however, priority of supply will be given to the existing system in Metro Manila where the demand-supply gap is already in a critical state.
5	Possibility of constructing WTP in Barangay Sampolac, Tanay	JICA Study Team has to identify the best location for WTP	Sampolac is situated at altitude of EL.380 m, which is higher than the Agos reservoir water level. Hence, WTP at Sampolac requires pumping of water, which is costly.

(Continue)

Table 13.2 Proposed Responses to Issues Raised at Workshops (3/5)

First Workshop held at Pililla on October 9, 2002 (3/3)

Issues/Questions		Comments/Recommendations Raised by People/LGUs	Proposed Response (by This Study)
W2. On Natural, Social, Economic and Institutional Aspects			
1	Denudation of forest	- Mitigation and rehabilitation of affected areas - Provision of buffer zone around water treatment plant	In principle, the area affected by the construction works will be restored to the original condition. WTP will have a 20-m clearance zone outside the yard fence.
2	Spoil disposal	Identify areas and get consent from LGU concerned	Spoil areas will be selected during detailed design. Due consultation will be made to LGUs in proceeding the land acquisition.
3	Economic revenue for barangays	For further study	Executing Agency will study this issue (See Para. A2-1 above)
4	Legal issues on land use/zoning: Lungsod Silangan, CARP, Zoning Ordinance	- MOA between concerned agencies - Amendment of zoning ordinances and CLUP	Executing Agency will look into this aspect when definite layout of the facilities is fixed in the detailed design.
5	Management of water system in municipalities of Rizal	MOA between implementing agency and water districts	This will be discussed when the supply to Rizal area goes into the implementation stage.

Note: The general consent has been given by the participants in regard to the two basic matters presented (see below), except for Item No.1 (a) below, for which commented was a condition that the issues and concerns raised during this workshop and succeeding consultations should be given due consideration.

The following are the basic matters presented to the participants:

1. No particular opposition to the necessity of the Proposed Project, where the necessity is expressed as:
 - (a) Necessity of water supply to Metro Manila and partial areas of Cavite and Rizal Provinces, in order to sustain the required level of hygienic conditions in the areas, which will otherwise be seriously worsened if adequate water supply is not implemented
 - (b) Effective use of hydropower development potential created by the Agos Dam (Agos Power Plant) and the Kaliwa-Morong Waterway (Lagundi Power Plant), for the benefit to national economy as well as for securing stable power supply sources in the vicinity
 - (c) Preservation of sufficient water resources requisite for sustaining the long-term livelihood of the people residing in the Agos River Basin, including Indigenous People (IP)
2. Principles of the Implementation of Relocation Plans:

The Study recommends that the relocation plans be implemented in line with the rules and guidelines set forth in the relevant laws and orders. The principles may be understood as (i) community participatory approach, (ii) provision of well-planned resettlement sites, (iii) resettlement procedures in line with the pre-established rules, and (iv) need of income restoration and livelihood supporting programs for the PAF.

Table 13.2 Proposed Responses to Issues Raised at Workshops (4/5)

Second Workshop held in Quezon City on February 14, 2003 (1/2)

Issues/Questions		Comments/Recommendations Raised by Local People/LGUs	Proposed Response (by This Study)
A. AGOS DAM AND RESERVOIR			
1	Manifestation as a proof of the issues and concerns raised	Prepare a manifesto signed by the group participants from Gen. Nakar, Infanta and Tanay with assurance that this will be presented to project proponent and be given due consideration (The Manifesto was submitted to the Study Team as part of the results of the Workshop No. 2)	The Study Team received the Manifesto signed by 16 persons who participated in the group discussion (Group Chairperson: Mr. Arnulfo F. Tena, LGU-General Nakar). The main points of statements in the Manifesto are as per Para. 2 to 7 below.
2	Legal basis on revenue	There should be a Memorandum of Agreement in order to implement and execute whatever benefit and revenue that the LGUs can get from the project based on the provisions of RA 7160 (Local Government Code and its Implementing Rules and Regulations).	The Executing Agency shall review this issue. Aside from this, the Study Team proposes that 'benefit and revenue' to the LGUs would be given in the form of 'mitigation measures for environmental impacts (Chapter V)' and 'project for regional development (Chapter X)'.
3	Fluctuation of streamflow	Irrigation will be the priority in the allocation of water during water shortage and to provide primary and permanent structures for the fluctuation of streamflow in Agos mainstream	Agos Dam will release sufficient water for the downstream irrigation. With regard to the change of river flows and water levels, the Study proposes to provide the riverbank structure (for river use) and ground sill (for water level control) as may be required. (Chapter X)
4	Preservation of native fish	The project proponent must provide measures or devices that will ensure the free movement of the native fish from the reservoir down to estuary	No fish ladder is provided for the Agos Dam in view of the little need. Migratory fishes are limited to mullets, eels and shrimps. None of these fish species are endemic only to this river system (Chapter V). On one hand, the reservoir will create new fishery development opportunities, such as raising of tilapia and milkfish.
5	Assurance/guarantee for power benefits	There should be a Memorandum of Agreement in order to implement and execute whatever benefits and revenues that the LGUs can get from the project based on the provisions of RA 9136 (EPIRA)	The matter shall be discussed among the Executing Agency, Hydropower BOT proponent and LGUs at the time of implementation of hydropower project.
6	Safety during the operation of the dam	Provide safety measures and facilities for the safety of the people downstream during the operation of the dam	This has been taken into account in the present feasibility study. The detail of each item will be further refined in the detailed design and during construction.
7	Employment opportunities during construction and operation of the dam	There should be a Memorandum of Agreement between the project proponent and the LGUs of Gen. Nakar, Infanta and Tanay indicating the priority for training and employment opportunities during the construction of the dam and operation of the dam	For purposing proper coordination with the locals, contractors will consider to give priorities to the skilled local workforce in hiring. The employment opportunity will depend on the skills owned by each personnel. The Study proposes establishing a manpower-training center for supporting the project-affected people in this regard. (Chapter X)

(Continue)

Table 13.2 Proposed Responses to Issues Raised at Workshop No.2 (5/5)

Second Workshop held in Quezon City on February 14, 2003 (2/2)

Issues/Questions		Comments/Recommendations Raised by Local People/LGUs	Proposed Response (by This Study)
B. WATERWAY FACILITIES			
1	Share/in lieu of LGUs	A specific bill must be submitted to Congress providing for a concrete formula on determining the rightful share/in lieu of LGUs which host the dam, watershed and other facilities. The proposed bill will be requested by the LGUs through the DILG Secretary	The Executing Agency shall review the appropriateness of this request.
2	Boundary issue particularly Tanay, Rizal and Sta. Maria, Laguna	Respective provincial board of the two provinces must address the issue	Boundary of the two municipalities is under dispute in the area of upstream part of Tunnel No.1. This issue should better be settled between the two provinces before the construction of the project.
3	Information gap on the part of LGUs on the results of the studies conducted by JICA-NWRB	LGUs must be provided with copies of the reports	This is subject to the decision by the Executing Agency.
4	Benefit to existing water districts	Availment of raw/treated water	The Study plans delivering water to the towns in Rizal Province.
5	Calamities and natural disasters like earthquakes and floods	Conduct extensive consultation with stakeholders and LGUs	This will be duly taken into account in the detailed design.
6	Spoils disposals	Identify areas and get consent from the concerned LGUs	This will be duly taken into account in the detailed design.
7	Effect of pipelines to existing structures	Provide clear compensation package	This will be duly taken into account in the detailed design.
8	Exclusion of Laguna and Quezon as water service area	Inclusion of Laguna and Quezon as water service area	Water supply to the Laguna and Quezon area from the presently proposed system is physically difficult.

Note: The following were also discussed at the Workshop:

The participants have no objection on the two basic matters presented provided that all issues and concerns are properly and justly considered; and the principles of the implementation of relocation plans, need of income restoration and livelihood supporting the programs should be strictly adhered.

The two basic matters presented to the participants are same as those presented in the First Workshop (see Table 13.2 (1/5) to (3/5) hereinbefore).