

Annex C.2  
**Financial Prices vs. Economic Prices**

Table C.2.1 **Conversion of Financial Prices into Economic Prices**

	Financial Prices Rp'000	Conversion Factor	Economic
<b>Communal Hand Pumps</b>			
Investment Cost (excl. tax)			
Traded goods	12,500	1.06	13,250
Non-traded goods	8,333	1.00	8,333
Labor	7,517	0.65	4,886
Project Overhead	3,150	1.00	3,150
Total Investment Cost	31,500		29,619
Annual O&M Costs (excl.tax)			
Traded goods	591	1.06	627
Non-traded goods	394	1.00	394
Labor	188	0.65	122
	1,174		1,143
<b>Hand pumps and Public Taps</b>			
Investment Cost (excl. tax)			
Traded goods	19,524	1.06	20,695
Non-traded goods	13,016	1.00	13,016
Labor	12,911	0.65	8,392
Project Overhead	5,050	1.00	5,050
Total Investment Cost	50,500		47,153
Annual O&M Costs (excl.tax)			
Traded goods	1,129	1.06	1,197
Non-traded goods	753	1.00	753
Labor	251	0.65	163
	2,133		2,113

Table C.2.1 **Conversion of Financial prices into Economic Prices**

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<b>Rainwater Collectors</b>			
Investment Cost (excl. tax)			
Traded goods	19,845	1.06	21,036
Non-traded goods	13,230	1.00	13,230
Labor	13,500	0.65	8,775
Project Overhead	5,175	1.00	5,175
Total Investment Cost	51,750		48,216
Annual O&M Costs (excl.tax)			
Traded goods	99	1.06	105
Non-traded goods	66	1.00	66
Labor	68	0.65	44
	233		215
<b>Sanitation</b>			
Investment Cost (excl. tax)			
Traded goods	2,659	1.06	2,819
Non-traded goods	3,989	1.00	3,989
Labor	4,433	0.65	2,881
Project Overhead	1,231	1.00	1,231
Total Investment Cost	12,312		10,920
Annual O&M Costs (excl.tax)			
Traded goods	72	1.06	76
Non-traded goods	72	1.00	72
Labor	133	0.65	87
	277		235

Table C.2.2 **Economic Costs of Households**

Source	No. of HH	Average Quantity per day (liters)	Average distance to source (meters)	Average Collect. Time hours/m	Coll. Costs /month per HH	Other Costs	Average Costs per HH per month	Month/Year	Total Costs per HH per season or yr.	Average Costs Rp/m <sup>3</sup>
EXISTING FACILITIES										
RAINY SEASON										
Cost of Collecting Water (Rp/hr)				145						
Dugwell	3	138	89	16.59	2,410	350	2,760	6	16,560	658
Hand pump	0	0	0	0.00	0	0	0	6	0	0
Electric Pump	0	0	0	0.00	0	0	0	6	0	0
Rainwater Collector	0	0	0	0.00	0	0	0	6	0	0
River/Waterpond	19	147	58	11.52	1,673	350	2,023	6	12,138	452
Watervendor	0	0	0	0.00	0	0	0	6	0	0
Neighbor	3	69	23	2.14	311	350	661	6	3,968	315
Public tap	0	0	0	0.00	0	0	0	6	0	0
Average Rainy Season		137	58	11	1,598	350	1,948	6	11,689	461

Table C.2.2 **Economic Costs of Households**

DRY SEASON										
Dugwell	1	92	92	11.44	1,661	350	2,011	6	12,065	719
Hand pump	0	0	0	0.00	0	0	0	6	0	0
Electric Pump	0	0	0	0.00	0	0	0	6	0	0
Rainwater Collector	0	0	0	0.00	0	0	0	6	0	0
River/Waterpond	21	163	66	14.54	2,111	350	2,461	6	14,766	496
Water vendor	0	0	0	0.00	0	0	0	6	0	0
Neighbor	3	69	23	2.14	311	350	661	6	3,968	315
Public tap	0	0	0	0.00	0	0	0	6	0	0
Average dry season		149	62	13	1,877	350	2,227	6	13,362	484
Average		143	60	12	1,738	350	2,088	12	25,051	472
NEW FACILITIES (Costs for HH)										
RWC	117	168	15	3.00	436	50	486	12	5,828	95
HP	117	255	30	6.00	871	50	921	12	11,057	119
PT	117	255	30	6.00	871	50	921	12	11,057	119

## Annex C.3 LEAST-COST ANALYSIS

Table C.3.1 Basic Data

Item	Unit	Quantity	Existing	Alt 1	Alt 2	Alt 3
<b>WATER SUPPLY</b>						
<b>COVERAGE</b>						
Total Population	no.		594	594	594	594
Household size	no.		5.1	5.1	5.1	5.1
covered by						
Unprotected Wells	% of pop		20	0	0	0
Untreated River Water	% of pop		80	0	0	0
Hand pump Wells	% of pop		0	100	33	0
Rainwater Collectors	% of pop		0	0	0	100
Piped Water Public Taps	% of pop		0	0	67	0
Total Coverage	% of pop		100	100	100	100
<b>ALTERNATIVE</b>						
<b>FACILITIES</b>						
Source development	no.					
No. of benef. per RWC	no.	20				
No. of benef. per HP/PT	no.	50				
Number of incr. RWC	no.			0	0	30
Number of incr. HP Wells	no.			12	4	0
Number of PT	no.			0	8	0
Number of private latrines	no.			107	107	107
No. of School Latrines	no.			1	1	1
<b>INVESTMENTS WS&amp;S</b>						
Sanitation Financial Prices	Rp'000			13,680	13,680	13,680
Sanitation Ec.Prices	Rp'000			10,920	10,920	10,920
Water Supply Fin Pr	Rp'000			34,650	55,550	56,925
Water Supply Ec.Pr.	Rp'000			29,619	47,153	48,216
WS&S Financial Prices	Rp'000			48,330	69,230	70,605
WS&S Economic Prices	Rp'000			40,539	58,073	59,136
<b>NUMBER OF</b>						
<b>BENEFICIARIES</b>						
WS through RWC	no.			0	0	594
WS through HP Well	no.			594	196	0
WS through piped scheme	no.			0	398	0
Total beneficiaries WS	no.			594	594	594

Table C.3.1 **Basic Data**

<b>ANNUAL COSTS WS</b>				
Water Supply Fin Prices	Rp'000	1,304	2,370	259
Sanitation Fin Prices	Rp'000	308	308	308
Water Supply Econ Prices	Rp'000	1,143	2,113	215
Sanitation Econ Prices	Rp'000	235	235	235
HH Financial Prices	Rp'000	1,952	1,952	1,952
HH Economic Prices	Rp'000	1,294	1,294	682
Total Financial Prices	Rp'000	3,564	4,630	2,519
Total Economic Prices	Rp'000	2,672	3,641	1,132
<b>PROJECT BENEFITS</b>				
NI In-House Water	m <sup>3</sup> /year	6,071	6,071	6,071
NI Out-house water	m <sup>3</sup> /year	3,035	3,035	1,084
Incremental Water	m <sup>3</sup> /year	1,734	1,734	0
Supply Costs NIW (inside)	Rp/m <sup>3</sup>	472	472	472
Supply Costs NIW (outside)	Rp/m <sup>3</sup>	236	236	236
Future Supply Cost WS	Rp/mo./	2,319	3,078	1,575
Water Demand	m <sup>3</sup> /mo./	8	8	5
Future WS&S Cost	Rp/m <sup>3</sup>	299	397	308
Current Supply Cost WS	Rp/m <sup>3</sup>	679	679	679
Annual Benefits NIW-in	Rp'000	2,866	2,866	2,866
Annual Benefits NIW-out	Rp'000	716	716	256
Annual Benefits IW	Rp'000	848	933	0
Annual Benefits Sanitation	Rp'000	2,107	2,107	2,107
<b>Total Annual Benefits</b>	<b>Rp'000</b>	<b>6,537</b>	<b>6,622</b>	<b>5,229</b>

Table C.3.2 **Comparison of Costs Among Alternatives**

Year	Alternative 1			Alternative 2			Alternative 3		
	Capital Cost (Rp'000)	Oper. Cost (Rp'000)	Total Cost (Rp'000)	Capital Cost (Rp'000)	Oper. Cost (Rp'000)	Total Cost (Rp'000)	Capital Cost (Rp'000)	Oper. Cost (Rp'000)	Total Cost (Rp'000)
1996	40,539	0	40,539	58,073	0	58,073	59,136	0	59,136
1997		2,672	2,672		3,641	3,641		1,132	1,132
1998		2,672	2,672		3,641	3,641		1,132	1,132
1999		2,672	2,672		3,641	3,641		1,132	1,132
2000		2,672	2,672		3,641	3,641		1,132	1,132
2001		2,672	2,672		3,641	3,641		1,132	1,132
2002		2,672	2,672		3,641	3,641		1,132	1,132
2003		2,672	2,672		3,641	3,641		1,132	1,132
2004		2,672	2,672		3,641	3,641		1,132	1,132
2005		2,672	2,672		3,641	3,641		1,132	1,132
2006		2,672	2,672		3,641	3,641		1,132	1,132
2007		2,672	2,672		3,641	3,641		1,132	1,132
2008		2,672	2,672		3,641	3,641		1,132	1,132
2009		2,672	2,672		3,641	3,641		1,132	1,132
2010		2,672	2,672		3,641	3,641		1,132	1,132
2011		2,672	2,672		3,641	3,641		1,132	1,132
2012		2,672	2,672		3,641	3,641		1,132	1,132
2013		2,672	2,672		3,641	3,641		1,132	1,132
2014		2,672	2,672		3,641	3,641		1,132	1,132
2015		2,672	2,672		3,641	3,641		1,132	1,132
Discounted Value	36,196	17,571	53,767	51,851	23,948	75,799	52,800	7,446	60,246

Table C.3.2 **Comparison of Costs Among Alternatives**

Supply	Supply in m <sup>3</sup>	Supply in m <sup>3</sup>	Supply in m <sup>3</sup>
1996	0	0	0
1997	10,840	10,840	7,155
1998	10,840	10,840	7,155
1999	10,840	10,840	7,155
2000	10,840	10,840	7,155
2001	10,840	10,840	7,155
2002	10,840	10,840	7,155
2003	10,840	10,840	7,155
2004	10,840	10,840	7,155
2005	10,840	10,840	7,155
2006	10,840	10,840	7,155
2007	10,840	10,840	7,155
2008	10,840	10,840	7,155
2009	10,840	10,840	7,155
2010	10,840	10,840	7,155
2011	10,840	10,840	7,155
2012	10,840	10,840	7,155
2013	10,840	10,840	7,155
2014	10,840	10,840	7,155
2015	10,840	10,840	7,155
Discounted Value	71,290	71,290	47,054
AIEC(incl. Sanitation)	754	1,063	1,280

Annex C.4 **Economic Benefit-Cost Analysis**

Year	Alternative 1					Alternative 2					Alternative 3				
	Capital Cost Rp'000	Oper. Cost Rp'000	Total Cost Rp'000	Gross Benefits Rp'000	Net Benefits Rp'000	Capital Cost Rp'000	Oper. Cost Rp'000	Total Cost Rp'000	Gross Benefits Rp'000	Net Benefits Rp'000	Capital Cost Rp'000	Oper. Cost Rp'000	Total Cost Rp'000	Gross Benefits Rp'000	Net Benefits Rp'000
1996	40,539	0	40,539	0	-40,539	69,230	0	69,230	0	-69,230	70,605	0	70,605	0	-70,605
1997		2,672	2,672	6,733	4,062		4,630	4,630	6,821	2,191		2,519	2,519	5,386	2,867
1998		2,672	2,672	6,935	4,264		4,630	4,630	7,025	2,395		2,519	2,519	5,547	3,028
1999		2,672	2,672	7,143	4,472		4,630	4,630	7,236	2,606		2,519	2,519	5,714	3,195
2000		2,672	2,672	7,358	4,686		4,630	4,630	7,453	2,823		2,519	2,519	5,885	3,366
2001		2,672	2,672	7,578	4,907		4,630	4,630	7,677	3,047		2,519	2,519	6,062	3,543
2002		2,672	2,672	7,806	5,134		4,630	4,630	7,907	3,277		2,519	2,519	6,243	3,724
2003		2,672	2,672	8,040	5,368		4,630	4,630	8,144	3,514		2,519	2,519	6,431	3,912
2004		2,672	2,672	8,281	5,609		4,630	4,630	8,389	3,759		2,519	2,519	6,624	4,105
2005		2,672	2,672	8,530	5,858		4,630	4,630	8,640	4,010		2,519	2,519	6,822	4,303
2006		2,672	2,672	8,785	6,114		4,630	4,630	8,900	4,270		2,519	2,519	7,027	4,508
2007		2,672	2,672	9,049	6,377		4,630	4,630	9,167	4,537		2,519	2,519	7,238	4,719
2008		2,672	2,672	9,321	6,649		4,630	4,630	9,442	4,812		2,519	2,519	7,455	4,936
2009		2,672	2,672	9,600	6,928		4,630	4,630	9,725	5,095		2,519	2,519	7,679	5,160
2010		2,672	2,672	9,888	7,216		4,630	4,630	10,017	5,387		2,519	2,519	7,909	5,390
2011		2,672	2,672	10,185	7,513		4,630	4,630	10,317	5,687		2,519	2,519	8,146	5,627
2012		2,672	2,672	10,490	7,819		4,630	4,630	10,627	5,997		2,519	2,519	8,391	5,872
2013		2,672	2,672	10,805	8,133		4,630	4,630	10,945	6,315		2,519	2,519	8,642	6,123
2014		2,672	2,672	11,129	8,457		4,630	4,630	11,274	6,644		2,519	2,519	8,902	6,383
2015		2,672	2,672	11,463	8,791		4,630	4,630	11,612	6,982		2,519	2,519	9,169	6,650
NPV	36,196	17,571	53,767	53,199	-568	61,812			53,890	-38,372	63,040	16,566	79,607	42,552	-37056
EIRR					0.12		30,450	92,262		0.02					0.02

**Annex 5 Financial Benefit-Cost Analysis**

Year	Alternative 1				
	Capital Cost (Rp'000)	Operating Cost (Rp'000)	Total Cost (Rp'000)	Gross Benefits (Rp'000)	Net Benefits (Rp'000)
1996	48,330	0	48,330	0	-48,330
1997		1,612	1,612	1,612	0
1998		1,612	1,612	1,612	0
1999		1,612	1,612	1,612	0
2000		1,612	1,612	1,612	0
2001		1,612	1,612	1,612	0
2002		1,612	1,612	1,612	0
2003		1,612	1,612	1,612	0
2004		1,612	1,612	1,612	0
2005		1,612	1,612	1,612	0
2006		1,612	1,612	1,612	0
2007		1,612	1,612	1,612	0
2008		1,612	1,612	1,612	0
2009		1,612	1,612	1,612	0
2010		1,612	1,612	1,612	0
2011		1,612	1,612	1,612	0
2012		1,612	1,612	1,612	0
2013		1,612	1,612	1,612	0
2014		1,612	1,612	1,612	0
2015		1,612	1,612	1,612	0
FNPV	43,152	10,601	53,753	10,601	-43,152