Table 8.5.4 Additional Number of Households to be Served in Phase I (Household Toilets)

Municipality	Area	No. of Households Served in the Base Year				No. of Households in 2000	Phase I Coverage (2000)							
							Household Coverage				Additional No. o f Households to be Served			
		Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total
Bangued (Capital)	Urban	556	1,899	0	2,455	2,975	573	1,718	0	2,291	17	0	0	17
	Rural	5	187	0	192	4,399	339	2,879	169	3,387	334	2,692	169	3,195
	Total	561	2,086	0	2,647	7,374	912	4,597	169	5,678	351	2,692	169	3,212
Bolinoy	Urban	7	13	0	20	148	28	86	0	114	21	73	0	94
	Rural	2	93	0	95	671	52	439	26	517	50	346	26	422
	Total	9	106	0	115	819	80	525	26	631	71	419	26	516
Bucay	Urban	16	190	0	206	539	57	358	0	415	41	168	0	209
	Rural	0	689	30	719	2,098	52	1,482	81	1,615	52	793	51	896
	Total	16	879	30	925	2,637	109	1,840	81	2,030	93	961	51	1,105
Bucloc	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	5	100	30	135	401	5	289	15	309	0	189	0	189
	Total	5	100	30	135	401	5	289	15	309	0	189	0	189
Daguioman	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	5	73	33	111	299	5	213	12	230	0	140	0	140
	Total	5	73	33	111	299	5	213	12	230	0	140	0	140
Danglas	Urban	3	206	10	219	316	17	226	0	243	14	20	0	34
	Rural	6	106	90	202	353	27	231	14	272	21	125	0	146
	Total	9	312	100	421	669	44	457	14	515	35	145	0	180
Dolores	Urban	19	210	3	232	395	76	228	0	304	57	18	0	75
	Rural	9	633	9	651	1,422	23	1,017	55	1,095	14	384	46	444
	Total	28	843	12	883	1,817	99	1,245	55	1,399	71	402	46	519
Lacub	Urban	3	120	0	123	131	25	76	0	101	22	0	0	22
	Rural	0	226	0	226	343	0	251	13	264	0	25	13	38
	Total	3	346	0	349	474	25	327	13	365	22	25	13	60
Lagangilang	Urban	48	259	0	307	497	96	287	0	383	48	28	0	76
	Rural	6	853	0	859	1,846	78	1,272	71	1,421	72	419	71	562
	Total	54	1,112	0	1,166	2,343	174	1,559	71	1,804	120	447	71	638

Table 8.5.4 Additional Number of Households to be Served in Phase I (Household Toilets) (Cont'd.)

Municipality	Area	No. of Households Served in the Base Year				No. of Households in 2000	Phase I Coverage (2000)							
							Household Coverage				Additional No. o f Households to be Served			
		Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total
Lagayan	Urban	3	119	6	128	170	33	98	0	131	30	0	0	30
	Rural	1	263	21	285	515	1	376	20	397	0	113	0	113
	Total	4	382	27	413	685	34	474	20	528	30	113	0	143
Langiden	Urban	5	69	0	74	77	5	54	0	59	0	0	0	0
	Rural	2	205	0	207	476	2	347	18	367	0	142	18	160
	Total	7	274	0	281	553	7	401	18	426	0	142	18	160
La Paz	Urban	19	605	0	624	671	75	442	0	517	56	0	0	56
	Rural	6	906	33	945	1,916	6	1,395	74	1,475	0	489	41	530
	Total	25	1,511	33	1,569	2,587	81	1,837	74	1,992	56	489	41	586
Licuan	Urban	7	110	0	117	128	25	74	0	99	18	0	0	18
	Rural	3	384	4	391	608	47	398	23	468	44	14	19	77
	Total	10	494	4	508	736	72	472	23	567	62	14	19	95
Luba	Urban	6	177	2	185	213	41	123	0	164	35	0	0	35
	Rural	4	373	129	506	934	72	611	36	719	68	238	0	306
	Total	10	550	131	691	1,147	113	734	36	883	103	238	0	341
Malibcong	Urban	0	0	0		0	0	0	0	0	0	0	0	0
	Rural	34	188	148	370	664	34	451	26	511	0	263	0	263
	Total	34	188	148	370	664	34	451	26	511	0	263	0	263
Manabo	Urban	9	433	0	442	807	78	543	0	621	69	110	0	179
	Rural	5	527	4	536	936	5	680	36	721	0	153	32	185
	Total	14	960	4	978	1,743	83	1,223	36	1,342	69	263	32	364
Penarrubia	Urban	120	46	25	191	202	120	46	25	191	0	0	0	0
	Rural	237	185	345	767	812	237	185	345	767	0	0	0	0
	Total	357	231	370	958	1,014	357	231	370	958	0	0	0	0
Pidigan	Urban	63	363	0	426	502	63	324	0	387	0	0	0	0
	Rural	0	970	0	970	1,368	0	1,000	53	1,053	0	30	53	83
	Total	63	1,333	0	1,396	1,870	63	1,324	53	1,440	0	30	53	83
Pilar	Urban	16	123	0	139	251	48	145	0	193	32	22	0	54
	Rural	5	606	0	611	1,529	118	1,000	59	1,177	113	394	59	566
	Total	21	729	0	750	1,780	166	1,145	59	1,370	145	416	59	620

Table 8.5.4 Additional Number of Households to be Served in Phase I (Household Toilets) (Cont'd.)

Municipality	Area	No. of Households Served in the Base Year				No. of Households in 2000	Phase I Coverage (2000)							
							Household Coverage				Additional No. o f Households to be Served			
		Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total
Sal-lapadan	Urban	6	122	0	128	274	53	158	0	211	47	36	0	83
	Rural	0	499	99	598	749	0	548	29	577	0	49	0	49
	Total	6	621	99	726	1,023	53	706	29	788	47	85	0	132
San Isidro	Urban	2	79	0	81	97	8	67	0	75	6	0	0	6
	Rural	0	431	0	431	687	0	503	26	529	0	72	26	98
	Total	2	510	0	512	784	8	570	26	604	6	72	26	104
San Juan	Urban	18	205	0	223	293	56	170	0	226	38	0	0	38
	Rural	14	533	0	547	1,617	14	1,169	62	1,245	0	636	62	698
	Total	32	738	0	770	1,910	70	1,339	62	1,471	38	636	62	736
San Quintin	Urban	7	64	34	105	150	29	87	0	116	22	23	0	45
	Rural	5	186	302	493	839	5	609	32	646	0	423	0	423
	Total	12	250	336	598	989	34	696	32	762	22	446	0	468
Tayum	Urban	51	293	0	344	470	90	272	0	362	39	0	0	39
	Rural	117	1,092	0	1,209	1,776	117	1,183	68	1,368	0	91	68	159
	Total	168	1,385	0	1,553	2,246	207	1,455	68	1,730	39	91	68	198
Tineg	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	14	178	34	226	609	14	432	23	469	0	254	0	254
	Total	14	178	34	226	609	14	432	23	469	0	254	0	254
Tubo	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	2	223	39	264	983	76	643	38	757	74	420	0	494
	Total	2	223	39	264	983	76	643	38	757	74	420	0	494
Villaviciosa	Urban	13	103	0	116	160	13	110	0	123	0	7	0	7
	Rural	2	494	0	496	840	2	613	32	647	0	119	32	151
	Total	15	597	0	612	1,000	15	723	32	770	0	126	32	158
Provincial Total	Urban	997	5,808	80	6,885	9,466	1,609	5,692	25	7,326	612	505	0	1,117
	Rural	489	11,203	1,350	13,042	29,690	1,331	20,216	1,456	23,003	842	9,013	786	10,641
	Total	1,486	17,011	1,430	19,927	39,156	2,940	25,908	1,481	30,329	1,454	9,518	786	11,758

Table 8.5.5 Additional Number of Households to be Served in Phase II (Household Toilets)

Municipality	Area	No. of Households Served in 2000				No. of Households in 2010	Phase II Coverage (2010)							
							Households Coverage				Add'l No. of Households to be Served			
		Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Flush	Total	Flush	Pour Flush	VIP Flush	Total
Bangued (Capital)	Urban	573	1,718	0	2,291	4,353	2,024	2,024	0	4,048	1,451	306	0	1,757
	Rural	339	2,879	169	3,387	6,559	1,077	5,023	0	6,100	738	2,144	0	2,882
	Total	912	4,597	169	5,678	10,912	3,101	7,047	0	10,148	2,189	2,450	0	4,639
Boliney	Urban	28	86	0	114	225	105	104	0	209	77	18	0	95
	Rural	52	439	26	517	1,000	233	697	0	930	181	258	0	439
	Total	80	525	26	631	1,225	338	801	0	1,139	258	276	0	534
Bucay	Urban	57	358	0	415	804	374	374	0	748	317	16	0	333
	Rural	52	1,482	81	1,615	3,245	73	2,945	0	3,018	21	1,463	0	1,484
	Total	109	1,840	81	2,030	4,049	447	3,319	0	3,766	338	1,479	0	1,817
Bucloc	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	5	289	15	309	620	5	572	0	577	0	283	0	283
	Total	5	289	15	309	620	5	572	0	577	0	283	0	283
Daguioman	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	5	213	12	230	438	5	402	0	407	0	189	0	189
	Total	5	213	12	230	438	5	402	0	407	0	189	0	189
Danglas	Urban	17	226	0	243	454	211	211	0	422	194	0	0	194
	Rural	27	231	14	272	497	54	408	0	462	27	177	0	204
	Total	44	457	14	515	951	265	619	0	884	221	177	0	398
Dolores	Urban	76	228	0	304	546	254	254	0	508	178	26	0	204
	Rural	23	1,017	55	1,095	2,160	31	1,978	0	2,009	8	961	0	969
	Total	99	1,245	55	1,399	2,706	285	2,232	0	2,517	186	987	0	1,173
Lacub	Urban	25	76	0	101	196	91	91	0	182	66	15	0	81
	Rural	0	251	13	264	530	0	493	0	493	0	242	0	242
	Total	25	327	13	365	726	91	584	0	675	66	257	0	323
Lagangilang	Urban	96	287	0	383	728	339	338	0	677	243	51	0	294
	Rural	78	1,272	71	1,421	2,855	109	2,546	0	2,655	31	1,274	0	1,305
	Total	174	1,559	71	1,804	3,583	448	2,884	0	3,332	274	1,325	0	1,599

Table 8.5.5 Additional Number of Households to be Served in Phase II (Household Toilets) (Cont'd.)

Municipality	Area	No. of Households Served in 2000				No. of Households in 2010	Phase II Coverage (2010)							
							Households Coverage				Add'l No. of Households to be Served			
		Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Flush	Total	Flush	Pour Flush	VIP Flush	Total
Lagayan	Urban	33	98	0	131	249	116	116	0	232	83	18	0	101
	Rural	1	376	20	397	754	1	700	0	701	0	324	0	324
	Total	34	474	20	528	1,003	117	816	0	933	83	342	0	425
Langiden	Urban	5	54	0	59	102	47	48	0	95	42	0	0	42
	Rural	2	347	18	367	645	2	598	0	600	0	251	0	251
	Total	7	401	18	426	747	49	646	0	695	42	251	0	293
La Paz	Urban	75	442	0	517	982	457	456	0	913	382	14	0	396
	Rural	6	1,395	74	1,475	2,646	6	2,455	0	2,461	0	1,060	0	1,060
	Total	81	1,837	74	1,992	3,628	463	2,911	0	3,374	382	1,074	0	1,456
Licuan	Urban	25	74	0	99	191	89	89	0	178	64	15	0	79
	Rural	47	398	23	468	991	230	692	0	922	183	294	0	477
	Total	72	472	23	567	1,182	319	781	0	1,100	247	309	0	556
Luba	Urban	41	123	0	164	341	159	158	0	317	118	35	0	153
	Rural	72	611	36	719	1,392	151	1,144	0	1,295	79	533	0	612
	Total	113	734	36	883	1,733	310	1,302	0	1,612	197	568	0	765
Malibcong	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	34	451	26	511	1,082	34	972	0	1,006	0	521	0	521
	Total	34	451	26	511	1,082	34	972	0	1,006	0	521	0	521
Manabo	Urban	78	543	0	621	1,159	539	539	0	1,078	461	0	0	461
	Rural	5	680	36	721	1,319	5	1,222	0	1,227	0	542	0	542
	Total	83	1,223	36	1,342	2,478	544	1,761	0	2,305	461	542	0	1,003
Penarrubia	Urban	120	46	25	191	307	143	143	0	286	23	97	0	120
	Rural	237	185	345	767	1,256	292	876	0	1,168	55	691	0	746
	Total	357	231	370	958	1,563	435	1,019	0	1,454	78	788	0	866
Pidigan	Urban	63	324	0	387	776	361	361	0	722	298	37	0	335
	Rural	0	1,000	53	1,053	2,078	0	1,933	0	1,933	0	933	0	933
	Total	63	1,324	53	1,440	2,854	361	2,294	0	2,655	298	970	0	1,268
Pilar	Urban	48	145	0	193	381	177	177	0	354	129	32	0	161
	Rural	118	1,000	59	1,177	2,238	241	1,840	0	2,081	123	840	0	963
	Total	166	1,145	59	1,370	2,619	418	2,017	0	2,435	252	872	0	1,124

Table 8.5.5 Additional Number of Households to be Served in Phase II (Household Toilets) (Cont'd.)

Municipality	Area	No. of Households Served in 2000				No. of Households in 2010	Phase II Coverage (2010)							
							Households Coverage				Add'l No. of Households to be Served			
		Flush	Pour Flush	VIP Latrine	Total		Flush	Pour Flush	VIP Flush	Total	Flush	Pour Flush	VIP Flush	Total
Sal-lapadan	Urban	53	158	0	211	416	193	194	0	387	140	36	0	176
	Rural	0	548	29	577	1,137	0	1,057	0	1,057	0	509	0	509
	Total	53	706	29	788	1,553	193	1,251	0	1,444	140	545	0	685
San Isidro	Urban	8	67	0	75	161	75	75	0	150	67	8	0	75
	Rural	0	503	26	529	1,043	0	970	0	970	0	467	0	467
	Total	8	570	26	604	1,204	75	1,045	0	1,120	67	475	0	542
San Juan	Urban	56	170	0	226	388	180	181	0	361	124	11	0	135
	Rural	14	1,169	62	1,245	2,278	14	2,105	0	2,119	0	936	0	936
	Total	70	1,339	62	1,471	2,666	194	2,286	0	2,480	124	947	0	1,071
San Quintin	Urban	29	87	0	116	216	100	101	0	201	71	14	0	85
	Rural	5	609	32	646	1,159	5	1,073	0	1,078	0	464	0	464
	Total	34	696	32	762	1,375	105	1,174	0	1,279	71	478	0	549
Tayum	Urban	90	272	0	362	663	308	309	0	617	218	37	0	255
	Rural	117	1,183	68	1,368	2,795	130	2,469	0	2,599	13	1,286	0	1,299
	Total	207	1,455	68	1,730	3,458	438	2,778	0	3,216	231	1,323	0	1,554
Tineg	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	14	432	23	469	908	14	830	0	844	0	398	0	398
	Total	14	432	23	469	908	14	830	0	844	0	398	0	398
Tubo	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	76	643	38	757	1,493	304	1,084	0	1,388	228	441	0	669
	Total	76	643	38	757	1,493	304	1,084	0	1,388	228	441	0	669
Villaviciosa	Urban	13	110	0	123	230	107	107	0	214	94	0	0	94
	Rural	2	613	32	647	1,230	2	1,142	0	1,144	0	529	0	529
	Total	15	723	32	770	1,460	109	1,249	0	1,358	94	529	0	623
Provincial Total	Urban	1,609	5,692	25	7,326	13,868	6,449	6,450	0	12,899	4,840	786	0	5,626
	Rural	1,331	20,216	1,456	23,003	44,348	3,018	38,226	0	41,244	1,687	18,010	0	19,697
	Total	2,940	25,908	1,481	30,329	58,216	9,467	44,676	0	54,143	6,527	18,796	0	25,323

Table 8.5.6 Additional Number of Public School Students to be Served in Phases I and II (School Toilets)

Municipality	Std. No. of Public School Student that can be Served in the Base Year	Projected No. of Public School Students in 2000	Phase I Coverage (2000)		Std. No. of Public School Students that can be Served in 2000	Projected No. of Public School Students in 2010	Phase II Coverage (2010)	
			Public School Students Coverage	Add'l No. of Public School Students to be Served			Public School Students Coverage	Add'l No. of Public School Students to be Served
Bangued (Capital)	2,550	7,851	5,888	3,338	5,888	8,858	7,972	2,084
Boliney	785	858	644	0	644	956	860	216
Bucay	1,800	4,916	3,687	1,887	3,687	5,287	4,758	1,071
Bucloc	100	391	293	193	293	439	395	102
Daguioman	367	402	302	0	302	428	385	83
Danglas	550	617	463	0	463	682	614	151
Dolores	1,300	1,846	1,385	85	1,385	2,009	1,808	423
Lacub	294	322	242	0	242	408	367	125
Lagangilang	2,254	2,711	2,033	0	2,033	3,047	2,742	709
Lagayan	955	1,027	770	0	770	1,140	1,026	256
Langiden	423	456	342	0	342	489	440	98
La Paz	750	2,493	1,870	1,120	1,870	2,712	2,441	571
Licuan	300	404	303	3	303	480	432	129
Luba	200	1,185	889	689	889	1,337	1,203	314
Malibcong	0	872	654	654	654	952	857	203
Manabo	600	2,134	1,601	1,001	1,601	2,390	2,151	550
Penarrubia	816	987	740	0	740	1,118	1,006	266
Pidigan	1,350	2,401	1,801	451	1,801	2,681	2,413	612
Pilar	700	2,442	1,832	1,132	1,832	2,610	2,349	517
Sal-lapadan	500	1,019	764	264	764	1,123	1,011	247
San Isidro	200	949	712	512	712	1,063	957	245
San Juan	1,400	2,461	1,846	446	1,846	2,631	2,368	522
San Quintin	850	971	728	0	728	1,095	986	258
Tayum	900	2,159	1,619	719	1,619	2,459	2,213	594
Tineg	0	884	663	663	663	964	868	205
Tubo	550	1,657	1,243	693	1,243	1,812	1,631	388
Villaviciosa	0	876	657	657	657	998	898	241
Provincial Total	20,494	45,291	33,971	14,507	33,971	50,168	45,151	11,180

Table 8.5.7 Number of Public Utilities with Sanitary Toilets in Phases I and II

Municipality	Type	Coverage in 1995		Phase I Coverage (2000)			No. of PU with Sanitary Toilets in 2000	Phase II Coverage (2010)		
		No. of PU	No. of PU with Sanitary Toilet	No. of PU	Add'l No. of Public Utilities with Sanitary Toilet	No. of PU with Sanitary Toilet		No. of PU	Add'l No. of Public Utilities with Sanitary Toilet	No. of PU with Sanitary Toilet
Bangued (Capital)	Public Market	1	1	1	0	1	1	2	1	2
	Bus/Jeep Term.	5	5	5	0	5	5	5	0	5
	Total	6	6	6	0	6	6	7	1	7
Boliney	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Bucay	Public Market	1	1	1	0	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	1	1	1	0	1	1	1	0	1
Bucloc	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Daguioman	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Danglas	Public Market	0	0	1	1	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	1	1	1	1	1	0	1
Dolores	Public Market	1	1	1	0	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	1	1	1
	Total	1	1	1	0	1	1	2	1	2
Lacub	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Lagangilang	Public Market	1	1	1	0	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	1	1	1
	Total	1	1	1	0	1	1	2	1	2
Lagayan	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Langiden	Public Market	0	0	0	0	0	0	1	1	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	1	1	1
La Paz	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Licuan	Public Market	0	0	0	0	0	0	1	1	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	1	1	1
Luba	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0

Table 8.5.7 Number of Public Utilities with Sanitary Toilets in Phases I and II (Cont'd.)

Municipality	Type	Coverage in 1995		Phase I Coverage (2000)			No. of PU with Sanitary Toilets in 2000	Phase II Coverage (2010)		
		No. of PU	No. of PU with Sanitary Toilet	No. of PU	Add'l No. of Public Utilities with Sanitary Toilet	No. of PU with Sanitary Toilet		No. of PU	Add'l No. of Public Utilities with Sanitary Toilet	No. of PU with Sanitary Toilet
Malibcong	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Manabo	Public Market	1	1	1	0	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	1	1	1	0	1	1	1	0	1
Penarrubia	Public Market	1	1	1	0	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	1	1	1	0	1	1	1	0	1
Pidigan	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Pilar	Public Market	1	0	1	1	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	1	0	1	1	1	1	1	0	1
Sal-lapadan	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
San Isidro	Public Market	0	0	1	1	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	1	1	1	1	1	0	1
San Juan	Public Market	1	1	1	0	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	1	1	1	0	1	1	1	0	1
San Quintin	Public Market	0	0	1	1	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	1	1	1	1	1	0	1
Tayum	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Tineg	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Tubo	Public Market	0	0	0	0	0	0	0	0	0
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Villaviciosa	Public Market	1	0	1	1	1	1	1	0	1
	Bus/Jeep Term.	0	0	0	0	0	0	0	0	0
	Total	1	0	1	1	1	1	1	0	1
Provincial Total	Public Market	9	7	12	5	12	12	15	3	15
	Bus/Jeep Term.	5	5	5	0	5	5	7	2	7
	Total	14	12	17	5	17	17	22	5	22

Note: PU - Public Utilities

8.6 Facilities, Equipment and Rehabilitation Required to Meet the Target Services

8.6.1 Water Supply

(1) Required water supply facilities

Urban water supply:

Urban water supply facilities required by target year shown in Table 8.6.1 were estimated as required number of house connections based on the additional service coverage.

As reference, following requirements were also estimated:

- daily average water demand at 100 lpcd consumption rate, and
- number of deep wells to meet the daily maximum water demand based on the groundwater productivity.
  (daily maximum water demand = 1.3 x daily average water demand)

Information pertaining to the expansion plan of Level III systems was arranged to be indicated in Table 8.6.1 and details in Table 8.6.2, however no information was available during this PW4SP preparation.

Rural water supply:

Rural water supply facilities required by target year shown in Table 8.6.3 were estimated as the number of Level II systems with number of communal faucets and number of Level I wells broken-down to deep and shallow wells. Two (2) untapped springs suitable for Level II system were confirmed during this PW4SP preparation.

(2) Required well drilling and rehabilitation equipment

Presently, only each one unit of truck-mounted percussion drilling rig is available at DPWH-DEO in the province.

Taking into account the maximum utilization of existing equipment, additional number of required equipment is estimated as described below.

Applicable type of well drilling equipment is determined considering the geological formation of the province that 50% of target area is medium to hard formation suitable to percussion type and the rest is soft to medium formation suitable to rotary type. Idling time for equipment overhauling/maintenance and rest days of workers are considered at 25% of the year.

Table 8.6.1 Urban Water Supply Facilities Required by Target Year

Municipality	Reference on Expansion of Existing Level III System						Phase I (2000) Requirements					Phase II (2010) Requirements				
	Name of Sytem (Operating Body)	Type	Coverage in 1995		Type of Water Sources[1]	Plan for Expansions[2]	Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources		Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources	
			No. of Brgy.	Served Population						Deep Well	Spring				Deep Well	Spring
Bangued (Capital)	Bangued W.D	Urban	8	10,309	SP	N.A.	1,026	194	103	1	0	5,730	1,433	5,730	6	0
		Rural	14	4,309												
		Total	22	14,618												
Boliney	Baoyan W.S	Urban	0	0	SP	N.A.										
		Rural	1	315												
		Total	1	315												
	Boliney W.S	Urban	1	675	SP	N.A.										
		Rural	0	0												
		Total	1	675												
	Danac W.S	Urban	0	0	SP	N.A.										
		Rural	2	945												
		Total	2	945												
	Daoangan W.S	Urban	0	0	SP	N.A.										
		Rural	1	490												
		Total	1	490												
	Dumagas W.S	Urban	0	0	SP	N.A.										
		Rural	1	200												
		Total	1	200												
	Kilong-Olao W.S	Urban	0	0	SP	N.A.										
		Rural	1	315												
		Total	1	315												
	Municipal Total	Urban	1	675												
		Rural	6	2265												
		Total	7	2940			88	16	9	0	1	118	30	118	0	1
Bucay	Bangcagan B.W.S.A	Urban	0	0	SP	N.A.	307	57	31	1	0	2,846	712	2,846	3	0
		Rural	1	290												
		Total	1	290												
Bucloc	None	Urban	0	0	N.A.	N.A.	0	0	0	0	0	0	0	0	0	0
		Rural	0	0												
		Total	0	0												
Daguioman	None	Urban	0	0	N.A.	N.A.	0	0	0	0	0	0	0	0	0	0
		Rural	0	0												
		Total	0	0												
Danglas	Abaquid W.A.	Urban	0	0	SP	N.A.	91	18	9	1	0	1,690	423	1,690	2	0
		Rural	1	215												
		Total	1	215												
Dolores	Cabaroan W.S.	Urban	0	0	SP	N.A.										
		Rural	1	125												
		Total	1	125												
	Dolores W.D	Urban	1	1,250	SP	N.A.										
		Rural	0	0												
		Total	1	1,250												
	Municipal Total	Urban	1	1250												
		Rural	1	125												
		Total	2	1375			91	18	9	1	0	797	199	797	1	0

Table 8.6.1 Urban Water Supply Facilities Required by Target Year (Con't.)

Municipality	Reference on Expansion of Existing Level III System						Phase I (2000) Requirements					Phase II (2010) Requirements				
	Name of Sytem (Operating Body)	Type	Coverage in 1995		Type of Water Sources[1]	Plan for Expansions[2]	Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources		Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources	
			No. of Brgy.	Served Population						Deep Well	Spring				Deep Well	Spring
Lacub	None	Urban	0	0	N.A.	N.A.	372	69	37	0	1	396	99	396	0	1
		Rural	0	0												
		Total	0	0												
Lagangilang	Lagangilang W.D	Urban	2	1,025	DW	N.A.	350	66	35	1	0	1,477	369	1,477	2	0
		Rural	2	435												
		Total	4	1,460												
Lagayan	None	Urban	0	0	N.A.	N.A.	291	55	29	1	0	686	172	686	1	0
		Rural	0	0												
		Total	0	0												
Langiden	None	Urban	0	0	N.A.	N.A.	23	5	2	1	0	378	95	378	1	0
		Rural	0	0												
		Total	0	0												
La Paz	None	Urban	0	0	N.A.	N.A.	396	75	40	1	0	3,453	863	3,453	4	0
		Rural	0	0												
		Total	0	0												
Licuan	Bongio W.S	Urban	0	0	SP	N.A.										
		Rural	1	155												
		Total	1	155												
	Bulbulala W.S	Urban	0	0	SP	N.A.										
		Rural	1	280												
		Total	1	280												
	Canayan W.S	Urban	0	0	SP	N.A.										
		Rural	1	185												
		Total	1	185												
	Domingiay W.S	Urban	0	0	SP	N.A.										
		Rural	1	145												
		Total	1	145												
	Mapisia W.S	Urban	1	215	SP	N.A.										
		Rural	0	0												
		Total	1	215												
	Poblacion W.S	Urban	1	180	SP	N.A.										
		Rural	0	0												
		Total	1	180												
	Tumalip W.S	Urban	0	0	SP	N.A.										
		Rural	1	200												
		Total	1	200												
	Municipal Total	Urban	2	395			93	17	9	0	1	261	65	261	0	1
		Rural	5	965												
		Total	7	1360												
Luba	Bangel W.S	Urban	1	815	SP	N.A.										
		Rural	0	0												
		Total	1	815												

Table 8.6.1 Urban Water Supply Facilities Required by Target Year (Cont'd.)

Municipality	Reference on Expansion of Existing Level III System						Phase I (2000) Requirements					Phase II (2010) Requirements				
	Name of Sytem (Operating Body)	Type	Coverage in 1995		Type of Water Sources[1]	Plan for Expansions[2]	Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources		Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources	
			No. of Brgy.	Served Population						Deep Well	Spring				Deep Well	Spring
Luba	Luzong W.S	Urban	0	0	SP	N.A.										
		Rural	1	605												
		Total	1	605												
	Municipal Total	Urban	1	815			278	48	28	1	0	243	61	243	1	0
		Rural	1	605												
		Total	2	1420												
Malibcong	None	Urban	0	0	N.A.	N.A.	0	0	0	0	0	0	0	0	0	0
		Rural	0	0												
		Total	0	0												
Manabo	None	Urban	0	0	N.A.	N.A.	406	78	41	1	0	4,137	1,034	4,137	4	0
		Rural	0	0												
		Total	0	0												
Penarrubia	Bangued W. D	Urban	1	467	SP	N.A.	39	7	4	1	0	333	83	333	1	0
		Rural	2	812												
		Total	3	1,279												
Pidigan	None	Urban	0	0	N.A.	N.A.	135	24	14	1	0	2,906	727	2,906	3	0
		Rural	0	0												
		Total	0	0												
Pilar	Dalit W.S	Urban	0	0	SP	N.A.										
		Rural	1	450												
		Total	1	450												
	Dintan W.S	Urban	0	0	SP	N.A.										
		Rural	1	225												
		Total	1	225												
	Pang-ot W.S	Urban	0	0	SP	N.A.										
		Rural	1	290												
		Total	1	290												
	Poblacion W .S	Urban	1	1,000	SP	N.A.										
		Rural	0	0												
		Total	1	1,000												
	Municipal Total	Urban	1	1000			172	31	17	1	0	320	80	320	1	0
		Rural	3	965												
		Total	4	1965												
Sal-lapadan	None	Urban	0	0	N.A.	N.A.	816	148	82	1	0	814	204	814	2	0
		Rural	0	0												
		Total	0	0												
San Isidro	None	Urban	0	0	N.A.	N.A.	47	8	5	1	0	585	146	585	2	0
		Rural	0	0												
		Total	0	0												
San Juan	None	Urban	0	0	N.A.	N.A.	285	59	29	1	0	1,237	309	1,237	2	0
		Rural	0	0												
		Total	0	0												
San Quintin	None	Urban	0	0	N.A.	N.A.	505	97	51	1	0	341	85	341	1	0
		Rural	0	0												
		Total	0	0												

Table 8.6.1 Urban Water Supply Facilities Required by Target Year (Con't.)

Municipality	Reference on Expansion of Existing Level III System						Phase I (2000) Requirements					Phase II (2010) Requirements				
	Name of Sytem (Operating Body)	Type	Coverage in 1995		Type of Water Sources[1]	Plan for Expansions[2]	Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources		Additional Population to be Served	Number of House Connections	Daily Average Water Demand (cu. m/day)	No. of Water Sources	
			No. of Brgy.	Served Population						Deep Well	Spring				Deep Well	Spring
Tayum	Deet W.S	Urban	0	0	DW	N.A.										
		Rural	1	520												
		Total	1	520												
	Tayum Water Service Corp.	Urban	1	1,500	DgW	N.A.										
		Rural	0	0												
		Total	1	1,500												
	Municipal Total	Urban	1	1500			180	35	18	1	0	917	229	917	1	0
		Rural	1	520												
		Total	2	2020												
Tineg	None	Urban	0	0	N.A.	N.A.	0	0	0	0	0	0	0	0	0	0
		Rural	0	0												
		Total	0	0												
Tubo	Poblacion W.S.	Urban	0	0	SP	N.A.										
		Rural	1	255												
		Total	1	255												
	Supo W.S	Urban	0	0	SP	N.A.										
		Rural	1	370												
		Total	1	370												
	Tub-tuba	Urban	0	0	SP	N.A.										
		Rural	1	200												
		Total	1	200												
	Wayangan W.S	Urban	0	0	SP	N.A.										
		Rural	1	390												
		Total	1	390												
	Municipal Total	Urban	0	0			0	0	0	0	0	0	0	0	0	0
		Rural	4	1215												
		Total	4	1215												
Villaviciosa	None	Urban	0	0	N.A.	N.A.	61	12	6	1	0	842	211	842	2	0
		Rural	0	0												
		Total	0	0												
Provincial Total		Urban	18	17,436			6,052	1,137	608	19	3	30,507	7,629	30,507	40	3
		Rural	41	12,721												
		Total	59	30,157												

Note: 1. *DW* - Deep Well, *SP* - Spring, *DgW* - Dug Well, and *Surf* - Surface Water.
2. Refer to supporting Table 8.6.3 for details.

Table 8.6.2 Plan for Expansion of Existing Level III System

Municipality	Name of Operating Body	Additional Areas Barangay to be Covered	Additional Population to be Served	Additional Water Sources	
				Type[1]	Capacity (cu. m/day)
Bangued (Capital)	Bangued W.D	N.A.	N.A.	N.A.	N.A.
Boliney	Baoyan W.S	N.A.	N.A.	N.A.	N.A.
	Boliney W.S	N.A.	N.A.	N.A.	N.A.
	Danac W.S	N.A.	N.A.	N.A.	N.A.
	Daoangan W.S	N.A.	N.A.	N.A.	N.A.
	Dumagas W.S	N.A.	N.A.	N.A.	N.A.
	Kilong-Olao W.S	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Bucay	Bangacagan B.W.S.A	N.A.	N.A.	N.A.	N.A.
Danglas	Abaquid W.A.	N.A.	N.A.	N.A.	N.A.
Dolores	Cabaroan W.S.	N.A.	N.A.	N.A.	N.A.
	Dolores W.D	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Lagangilang	Lagangilang W.D	N.A.	N.A.	N.A.	N.A.
Licuan	Bonglo W.S	N.A.	N.A.	N.A.	N.A.
	Bulbulala W.S	N.A.	N.A.	N.A.	N.A.
	Canayan W.S	N.A.	N.A.	N.A.	N.A.
	Dominglay W.S	N.A.	N.A.	N.A.	N.A.
	Mapisla W.S	N.A.	N.A.	N.A.	N.A.
	Poblacion W.S	N.A.	N.A.	N.A.	N.A.
	Tumalip W.S	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Luba	Bangel W.S	N.A.	N.A.	N.A.	N.A.
	Luzong W.S	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Penarrubia	Bangued W.D	N.A.	N.A.	N.A.	N.A.
Pilar	Dalit W.S	N.A.	N.A.	N.A.	N.A.
	Dintan W.S	N.A.	N.A.	N.A.	N.A.
	Pang-out W.S	N.A.	N.A.	N.A.	N.A.
	Poblacion W.S	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Tayum	Deet W.S	N.A.	N.A.	N.A.	N.A.
	Tayum Water Service Corp.	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Tubo	Poblacion W.S	N.A.	N.A.	N.A.	N.A.
	Supo W.S	N.A.	N.A.	N.A.	N.A.
	Tub-tuba	N.A.	N.A.	N.A.	N.A.
	Wayangan W.S	N.A.	N.A.	N.A.	N.A.
Municipal Total		N.A.	N.A.		N.A.
Provincial Total		N.A.	N.A.		N.A.

Note: 1. *DW* - Deep Well, *SDgW* - Dug Well, *P* - Spring, *DgW* - Dug Well, and *Surf* - Surface Water Intake.

Table 8.6.3 Rural Water Supply Facilities Required by Target Year

Municipality	Phase I (2000) Requirements									Phase II (2010) Requirements						
	Level II		Level I							Level I						
	Number of System	No. of Communal Faucets	Number of Deep Wells				Number of Shallow Wells	Number of Spring Dev.	Total	Number of Deep Wells				Number of Shallow Wells	Number of Spring Dev.	Total
			30 m	50 m	70 m	Sub-total				30 m	50 m	70 m	Sub-total			
Bangued (Capital)	0	0	0	9	0	9	0	0	9	0	44	0	44	0	0	44
Boliney	0	0	0	0	0	0	0	8	8	0	0	0	0	0	7	7
Bucay	0	0	0	13	0	13	0	0	13	0	21	0	21	0	0	21
Bucloc	0	0	0	0	0	0	0	12	12	0	0	0	0	0	4	4
Daguioman	0	0	0	0	0	0	0	10	10	0	0	0	0	0	3	3
Danglas	0	0	0	1	0	1	0	0	1	0	4	0	4	0	0	4
Dolores	0	0	0	0	0	0	0	0	0	0	13	0	13	0	0	13
Lacub	0	0	0	0	0	0	0	10	10	0	0	0	0	0	3	3
Lagangilang	0	0	0	28	0	28	0	0	28	0	18	0	18	0	0	18
Lagayan	0	0	0	20	0	20	0	0	20	0	5	0	5	0	0	5
Langiden	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	5
La Paz	0	0	0	24	0	24	0	0	24	0	19	0	19	0	0	19
Licuan	0	0	0	0	0	0	0	12	12	0	0	0	0	0	6	6
Luba	0	0	34	0	0	34	0	0	34	9	0	0	9	0	0	9
Malibcong	0	0	0	0	0	0	0	8	8	0	0	0	0	0	7	7
Manabo	0	0	2	0	0	2	0	0	2	9	0	0	9	0	0	9
Penarrubia	0	0	0	2	0	2	0	0	2	0	8	0	8	0	0	8
Pidigan	0	0	0	4	0	4	0	0	4	0	14	0	14	0	0	14
Pilar	0	0	20	0	0	20	0	0	20	15	0	0	15	0	0	15
Sal-lapadan	0	0	13	0	0	13	0	0	13	7	0	0	7	0	0	7
San Isidro	0	0	4	0	0	4	0	0	4	7	0	0	7	0	0	7
San Juan	0	0	0	24	0	24	0	0	24	0	16	0	16	0	0	16
San Quintin	0	0	0	16	0	16	0	0	16	0	8	0	8	0	0	8
Tayum	0	0	0	12	0	12	0	0	12	0	18	0	18	0	0	18
Tineg	0	0	0	0	0	0	0	22	22	0	0	0	0	0	6	6
Tubo	2	40	0	0	0	0	0	9	9	0	0	0	0	0	10	10
Villaviciosa	0	0	3	0	0	3	0	0	3	8	0	0	8	0	0	8
Provincial Total	2	40	76	153	0	229	0	91	320	55	193	0	248	0	46	294

Medium size rotary drilling rig (truck-mounted top-head drive type for deep well):

Average performance

- 1 well/20 days (10 m/day of drilling rate with finishing work)

Annual accomplishment

- 13 wells/year (365 days/year ÷ 20 days/well x 0.75)

Required number

- 3 sets for 50% of the total 320 deep wells

Medium size percussion drilling rig (truck-mounted type for deep well):

Average performance

- 1 well/30 days (5 m/day of drilling rate with finishing work)

Annual accomplishment

- 9 wells/year (365 days/year ÷30 days/well x 0.75)

Required number

- 4 sets for 50% of the total 320 deep wells

Well rehabilitation equipment:

Average performance

- 1 well/7 days (well redevelopment and finishing work

Annual accomplishment

- 39 wells/year (365 days/year ÷7 days/well x 0.75)

Required number

- 1 set for 10% of 320 Level I deep wells

Support vehicle:

Type - pick-up truck with winch, double cab

Required number

- 1 unit for well rehabilitation

Considering the utilization of existing percussion drilling rig, the following equipment shall be mobilized/procured either by private sector or LGUs to accomplish the physical targets:

- 3 sets of medium size rotary rig for 50% of deep wells,
- 3 sets of medium size percussion rig for 50% of deep wells
- 1 set of well rehabilitation equipment for 10% of deep wells (at least 1 set shall be held by the provincial government), and
- 1 unit of support vehicle for well rehabilitation.

In addition to the above, service trucks equipped with crane are required for each unit of medium size rotary and percussion rigs for hauling drilling tools and water.

Table 8.6.4 Urban Household Toilets Required by Target Year

Municipality	Phase I (2000) Requirements								Phase II (2010) Requirements							
	Add'l HHs to be Served				No.of HHs Toilets				Add'l HHs to be Served				No.of HHs Toilets			
	Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total
Bangued (Capital)	17	0	0	17	17	0	0	17	1,451	306	0	1,757	1,451	306	0	1,757
Boliney	21	73	0	94	21	73	0	94	77	18	0	95	77	18	0	95
Bucay	41	168	0	209	41	168	0	209	317	16	0	333	317	16	0	333
Bucloc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daguioman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Danglas	14	20	0	34	14	20	0	34	194	0	0	194	194	0	0	194
Dolores	57	18	0	75	57	18	0	75	178	26	0	204	178	26	0	204
Lacub	22	0	0	22	22	0	0	22	66	15	0	81	66	15	0	81
Lagangilang	48	28	0	76	48	28	0	76	243	51	0	294	243	51	0	294
Lagayan	30	0	0	30	30	0	0	30	83	18	0	101	83	18	0	101
Langiden	0	0	0	0	0	0	0	0	42	0	0	42	42	0	0	42
La Paz	56	0	0	56	56	0	0	56	382	14	0	396	382	14	0	396
Licuan	18	0	0	18	18	0	0	18	64	15	0	79	64	15	0	79
Luba	35	0	0	35	35	0	0	35	118	35	0	153	118	35	0	153
Malibcong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manabo	69	110	0	179	69	110	0	179	461	0	0	461	461	0	0	461
Penarrubia	0	0	0	0	0	0	0	0	23	97	0	120	23	97	0	120
Pidigan	0	0	0	0	0	0	0	0	298	37	0	335	298	37	0	335
Pilar	32	22	0	54	32	22	0	54	129	32	0	161	129	32	0	161
Sal-lapadan	47	36	0	83	47	36	0	83	140	36	0	176	140	36	0	176
San Isidro	6	0	0	6	6	0	0	6	67	8	0	75	67	8	0	75
San Juan	38	0	0	38	38	0	0	38	124	11	0	135	124	11	0	135
San Quintin	22	23	0	45	22	23	0	45	71	14	0	85	71	14	0	85
Tayum	39	0	0	39	39	0	0	39	218	37	0	255	218	37	0	255
Tineg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tubo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Villaviciosa	0	7	0	7	0	7	0	7	94	0	0	94	94	0	0	94
Provincial Total	612	505	0	1,117	612	505	0	1,117	4,840	786	0	5,626	4,840	786	0	5,626

Table 8.6.5 Rural Household Toilets Required by Target Year

Municipality	Phase I (2000) Requirements								Phase II (2010) Requirements							
	Add'l HHs to be Served				No.of HHs Toilets				Add'l HHs to be Served				No.of HHs Toilets			
	Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total	Flush	Pour Flush	VIP Latrine	Total
Bangued (Capital)	334	2,692	169	3,195	334	2,692	169	3,195	738	2,144	0	2,882	738	2,144	0	2,882
Boliney	50	346	26	422	50	346	26	422	181	258	0	439	181	258	0	439
Bucay	52	793	51	896	52	793	51	896	28	1,456	0	1,484	28	1,456	0	1,484
Bucloc	0	189	0	189	0	189	0	189	0	283	0	283	0	283	0	283
Daguioman	0	140	0	140	0	140	0	140	0	189	0	189	0	189	0	189
Danglas	21	125	0	146	21	125	0	146	32	172	0	204	32	172	0	204
Dolores	14	384	46	444	14	384	46	444	12	957	0	969	12	957	0	969
Lacub	0	25	13	38	0	25	13	38	0	242	0	242	0	242	0	242
Lagangilang	72	419	71	562	72	419	71	562	42	1,263	0	1,305	42	1,263	0	1,305
Lagayan	0	113	0	113	0	113	0	113	0	324	0	324	0	324	0	324
Langiden	0	142	18	160	0	142	18	160	0	251	0	251	0	251	0	251
La Paz	0	489	41	530	0	489	41	530	0	1,060	0	1,060	0	1,060	0	1,060
Licuan	44	14	19	77	44	14	19	77	183	294	0	477	183	294	0	477
Luba	68	238	0	306	68	238	0	306	95	517	0	612	95	517	0	612
Malibcong	0	263	0	263	0	263	0	263	0	521	0	521	0	521	0	521
Manabo	0	153	32	185	0	153	32	185	0	542	0	542	0	542	0	542
Penarrubia	0	0	0	0	0	0	0	0	55	691	0	746	55	691	0	746
Pidigan	0	30	53	83	0	30	53	83	0	933	0	933	0	933	0	933
Pilar	113	394	59	566	113	394	59	566	149	814	0	963	149	814	0	963
Sal-lapadan	0	49	0	49	0	49	0	49	0	509	0	509	0	509	0	509
San Isidro	0	72	26	98	0	72	26	98	0	467	0	467	0	467	0	467
San Juan	0	636	62	698	0	636	62	698	0	936	0	936	0	936	0	936
San Quintin	0	423	0	423	0	423	0	423	0	464	0	464	0	464	0	464
Tayum	0	91	68	159	0	91	68	159	27	1,272	0	1,299	27	1,272	0	1,299
Tineg	0	254	0	254	0	254	0	254	0	398	0	398	0	398	0	398
Tubo	74	420	0	494	74	420	0	494	260	409	0	669	260	409	0	669
Villaviciosa	0	119	32	151	0	119	32	151	0	529	0	529	0	529	0	529
Provincial Total	842	9,013	786	10,641	842	9,013	786	10,641	1,802	17,895	0	19,697	1,802	17,895	0	19,697

Table 8.6.6 Public School Toilets Required by Target Year

Municipality	Phase I (2000) Requirements			Phase II (2010) Requirements		
	Add'l Public School Students to be Served	No. of Toilet Units	No. of Toilet Facilities	Add'l Public School Students to be Served	No. of Toilet Units	No. of Toilet Facilities
Bangued (Capital)	3,338	67	13	2,084	42	8
Boliney	0	0	0	216	4	1
Bucay	1,887	38	8	1,071	21	4
Bucloc	193	4	1	102	2	0
Daguioman	0	0	0	83	2	0
Danglas	0	0	0	151	3	1
Dolores	85	2	0	423	8	2
Lacub	0	0	0	125	3	1
Lagangilang	0	0	0	709	14	3
Lagayan	0	0	0	256	5	1
Langiden	0	0	0	98	2	0
La Paz	1,120	22	4	571	11	2
Licuan	3	0	0	129	3	1
Luba	689	14	3	314	6	1
Malibcong	654	13	3	203	4	1
Manabo	1,001	20	4	550	11	2
Penarrubia	0	0	0	266	5	1
Pidigan	451	9	2	612	12	2
Pilar	1,132	23	5	517	10	2
Sal-lapadan	264	5	1	247	5	1
San Isidro	512	10	2	245	5	1
San Juan	446	9	2	522	10	2
San Quintin	0	0	0	258	5	1
Tayum	719	14	3	594	12	2
Tineg	663	13	3	205	4	1
Tubo	693	14	3	388	8	2
Villaviciosa	657	13	3	241	5	1
Provincial Total	14,507	290	60	11,180	222	44

Table 8.6.7 Public Toilets Required by Target Year

Municipality	Type	Phase I (2000) Requirements	Phase II (2010) Requirements
		Number of Public Toilets	Number of Public Toilets
Bangued (Capital)	Public Market	0	1
	Bus/Jeepney Term.	0	0
	Total	0	1
Boliney	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Bucay	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Bucloc	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Daguioman	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Danglas	Public Market	1	0
	Bus/Jeepney Term.	0	0
	Total	1	0
Dolores	Public Market	0	0
	Bus/Jeepney Term.	0	1
	Total	0	1
Lacub	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Lagangilang	Public Market	0	0
	Bus/Jeepney Term.	0	1
	Total	0	1
Lagayan	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Langiden	Public Market	0	1
	Bus/Jeepney Term.	0	0
	Total	0	1
La Paz	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Licuan	Public Market	0	1
	Bus/Jeepney Term.	0	0
	Total	0	1
Luba	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0

Table 8.6.7 Public Toilets Required by Target Year (Cont'd.)

Municipality	Type	Phase I (2000) Requirements	Phase II (2010) Requirements
		Number of Public Toilets	Number of Public Toilets
Malibcong	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Manabo	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Penarrubia	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Pidigan	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Pilar	Public Market	1	0
	Bus/Jeepney Term.	0	0
	Total	1	0
Sal-lapadan	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
San Isidro	Public Market	1	0
	Bus/Jeepney Term.	0	0
	Total	1	0
San Juan	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
San Quintin	Public Market	1	0
	Bus/Jeepney Term.	0	0
	Total	1	0
Tayum	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Tineg	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Tubo	Public Market	0	0
	Bus/Jeepney Term.	0	0
	Total	0	0
Villaviciosa	Public Market	1	0
	Bus/Jeepney Term.	0	0
	Total	1	0
Provincial Total	Public Market	5	3
	Bus/Jeepney Term.	0	2
	Total	5	5

C. SECTOR IMPLEMENTATION ARRANGEMENTS

C. SECTOR IMPLEMENTATION ARRANGEMENTS

9. SECTOR MANAGEMENT PLAN

9.4 Project Management Arrangements

Table 9.4.1 Format for Level I Project Data

Form _____

PROPOSED LEVEL I PROJECT DATA

Notice : This form shall be accomplished upon instruction on PST/PWSD

LOCATION

1.1 Barangay/Sitio	1.3 Province
1.2 Municipality	1.4 Region

POP. DATA

2.1 Total Community/Barangay Population	2.3 Proposed Population to be Served
2.2 Total Number of Households	2.4 Proposed Number of Households to be Served

INFORMATION ON THE WELL SITE

3.1 Ownership : ☐ Public ☐ Private	3.3 Location:
3.2 Description :	3.4 Donor (If Private Lot):

DESCRIPTION OF EXISTING NEARBY SOURCE(S) (Use separate sheets if necessary)

4.1 Type of Point Source:
- ☐ Deep Well
- ☐ Shallow Well
- ☐ Spring
- ☐ Others (dug well pond)

4.2 Ownership :
- ☐ Public
- ☐ Private

4.3 For wells :
- Casing diameter_____ in. or_____m.
- Casing depth _____ ft. or_____m.
- Water level Well _____ ft. or_____m.
- Well capacity/yield _____ gpm. or_____m.

4.4 For Springs : Capacity/yield _____ gpm. or_____lps.

Approx. elevation above or below Service Area _____ ft. or _____ m

Location
- ☐ Inside of service area
- ☐ Outside of service area

Approximate distance from center of service area _____km.

Prepared by :

_____ _____

Municipol Liason Staff Date

Table 9.4.2 Format for Level II Feasibility Study

Form _____

FEASIBILITY STUDY (Level II) Notice : This form shall be accomplished upon instruction of the PST/PWSO.	Barangay	Municipality
	Province	Region

PROJECT SUMMARY

POPULATION DATA

1. Present Population	2. Design Population	3. Number of Households
		6. Number of Faucets

TECHNICAL DATA

4. Type of Source ☐ Spring ☐ Well ☐ Surface Water	5. Type of System ☐ Gravity ☐ Pumped	
	7. Pump Horsepower _____ HP	8. Pumping Time _____ Hours per Day
9. Total Average Daily Demand _____ Liters	10. Storage Tank Capacity _____ Liters	11. Pump Discharge Capacity _____ LPS

FINANCIAL DATA

12. Total System Cost P _____	13. Maximum Loan Amount P _____	14. Interest Rate _____
15. Local Equity P _____	16. Funding Cost per Household P _____	17. Repayment Period (months) _____

18. Type of Local Equity
☐ Cash ☐ Labor ☐ Materials ☐ Others, _____

19. Total Monthly Expense P _____	20. Monthly Fee Per Household P _____

ANNEXES

☐ 1 Survey Form	☐ 5 Design of Pipe Lines	☐ 9A Fittings Schedule	☐ 12 Financial Analysis
☐ 2 Map of the Project Area	☐ 6 Design of Reservoir	(G.I. Pipes)	☐ 13 Availability of Local
☐ 3 Design Criteria and	and Pump	☐ 9B Fittings Schedule	Equity
Basic Design Data	☐ 7 Detailed Design Plan	☐ 10 Bill of Materials	
☐ 4 Schematic Diagram of	☐ 8 Pipes Schedule	☐ 11 Cost Summary	
the System			

Prepared by :	Endorsed by :
_____ _____ Municipal Liason Staff Date	_____ _____ PST/PWSO Coordinator Date

Annex 1

SURVEY FORM
_____ Rural Water Supply Project

A. LOCATION

Barangay : _____ Province : _____
Municipality : _____ Region Number : _____

B. GENERAL INFORMATION

1. Population _____
2. Number of households _____
3. Distance from poblacion _____ kilometers
4. Availability of electricity Yes ☐ No ☐
5. Distance form electric line _____ kilometers
6. Power cost per kilowatt hour P _____
7. Availability of public transportation _____
8. Main livelihood of residents
   - ☐ Land transport
   - ☐ Water transport
   - ☐ Farming
   - ☐ Industry ☐ Others
   - ☐ Fishing

C. TECHNICAL INFORMATION

1. Are there reliable sources of potable water?
   ☐ Yes ☐ No

a) For Wells
- Well capacity : _____ lps
- Casing diameter : _____
- Casing depth : _____
- Water level from top of well : _____
- Location :
  - ☐ Within service area
  - ☐ Outside _____M. from service area

b) For Springs
- Average dry season flow : _____ ☐ GPM ☐ LPS
- Relative elevation of spring
  - a. _____ ☐ ft. ☐ m. above service area
  - b. _____ ☐ ft. ☐ m. below service area
- Location :
  - ☐ Within service area
  - ☐ Outside _____ m. from service area

2. Are there water supply system materials and equipment (pumps, pipes, fittings) which can be donated for this project from other source?

☐ Yes ☐ No

For pumps : Type : _____ Power : _____ HP

For pipes : ☐ Galvanized Iron ☐ PVC
☐ Others, specify _____

3. Is there an existing water tank that can be used? ☐ Yes ☐ No

Type : ☐ Steel ☐ Reinforced Concrete

Capacity : _____ ☐ Gallons ☐ Cubic Meters

Location: (Please indicate in the map of the project area)

Relative elevation with respect to service area ____ ☐ ft. ____ ☐ m.

4. Are there other sites where water tanks may be erected? ☐ Yes ☐ No
Location : (please indicate in the map of the project area)

Relative elevation with respect to service area ____ ☐ ft. ____ ☐ m.

5. Does the barrio have skilled personnel? ☐ Yes ☐ No

If yes, how many? Estimated Number

Plumbers : _____
Masons : _____
Carpenters : _____
Others : _____

If no, are there competent contractors near the area?

Plumbing contractor : ☐ Yes ☐ No
Tank fabricator : ☐ Yes ☐ No

Are there suppliers of materials (pumps, pipes, fittings) in the municipality?

☐ Yes ☐ No

D. FINANCIAL INFORMATION

1. What can the barangay provide as local equity?

Cash :	₱ _____		
Labor :	_____	man-days	
Materials :	Sand	: _____	cu. m.
	Gravel	: _____	cu. m.
	Cement	: _____	bags
	Others, specify :	_____	

2. Have the people been informed of the current financing policies for Level II systems, particularly the monthly fees required to repay loan & provide for O & M?

☐ Yes ☐ No

3. How much are the people willing to pay per household per month as a water fee?

Below ₱ 6.00 ☐ ₱ 10.00 - 15.00 ☐ Others ☐
₱ 6.00 - 10.00 ☐ 15.00 - 20.00 ☐ Specify : _____

4. Average income per household ₱ _____ per month

E. INSTITUTIONAL INFORMATION

1. Is there an existing association who is ready, willing and able to manage the system
☐ Yes ☐ No
If yes, please specify. _____

2. Are people willing to join a water association to operate and manage a water supply system? ☐ Yes ☐ No

3. How many households are willing to be members? _____ households.

4. Name at least three (3) leaders of the community who can act as officers of the association, if required.

Name	Address
_____	_____
_____	_____
_____	_____
_____	_____

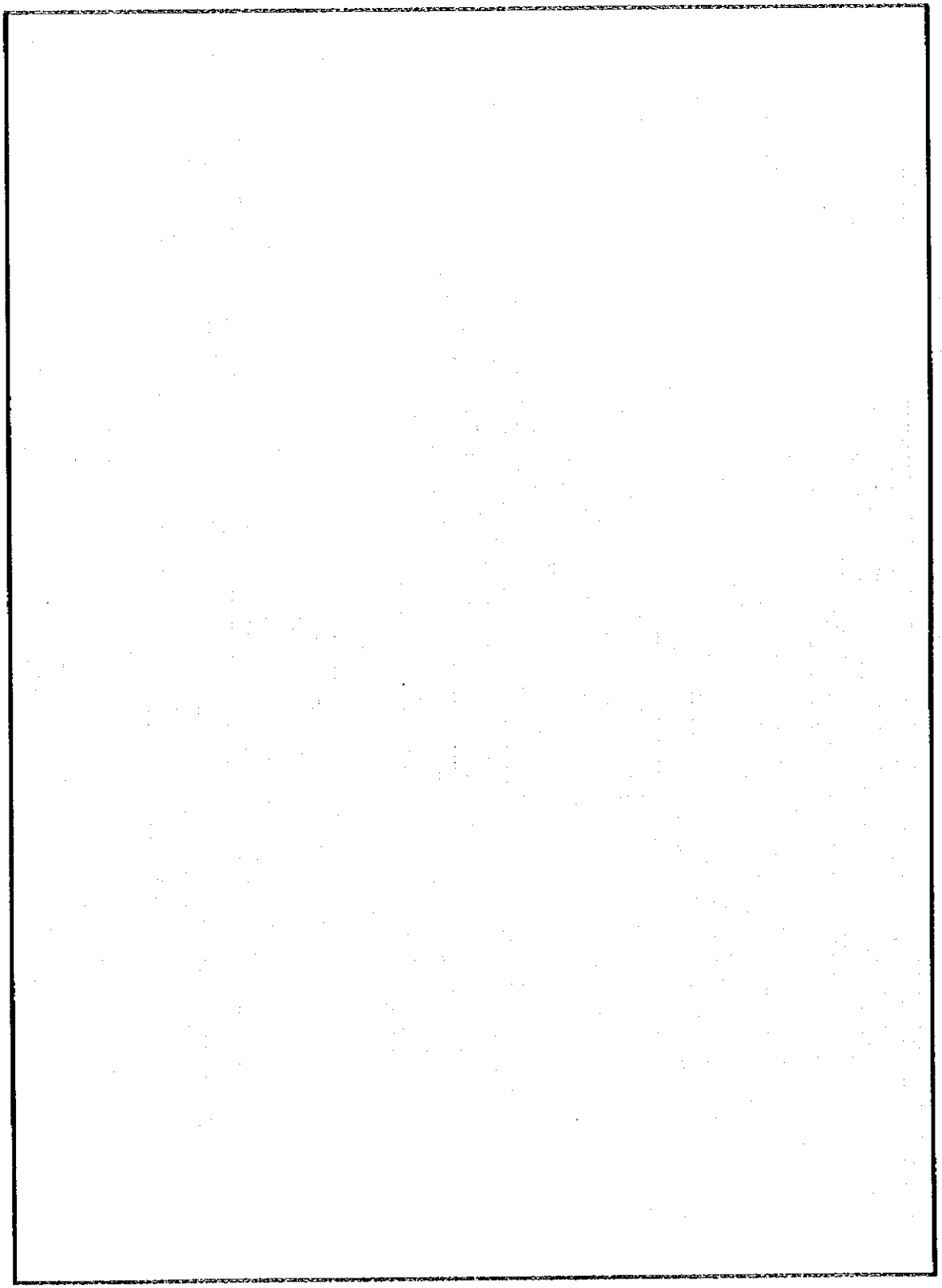
F. MAP OF THE AREA

Please attach map of the area proposed to be served. Indicate location of houses, buildings and other structures to be served including roads, the water source(s) and possible locations of storage tanks. The map should preferably be drawn to scale.

Important : If map cannot be drawn to scale, indicate distance measurements between important points along roads, or possible routes of distribution pipes with households properly indicated. For rolling terrain, indicate elevation differences between measurement points.

G. REMARKS :

Annex 2
MAP OF THE PROJECT AREA
_____ Rural Water Supply Project



Annex 3

DESIGN CRITERIA AND BASIC DESIGN DATA
_____ Rural Water Supply Project

I. Design Criteria

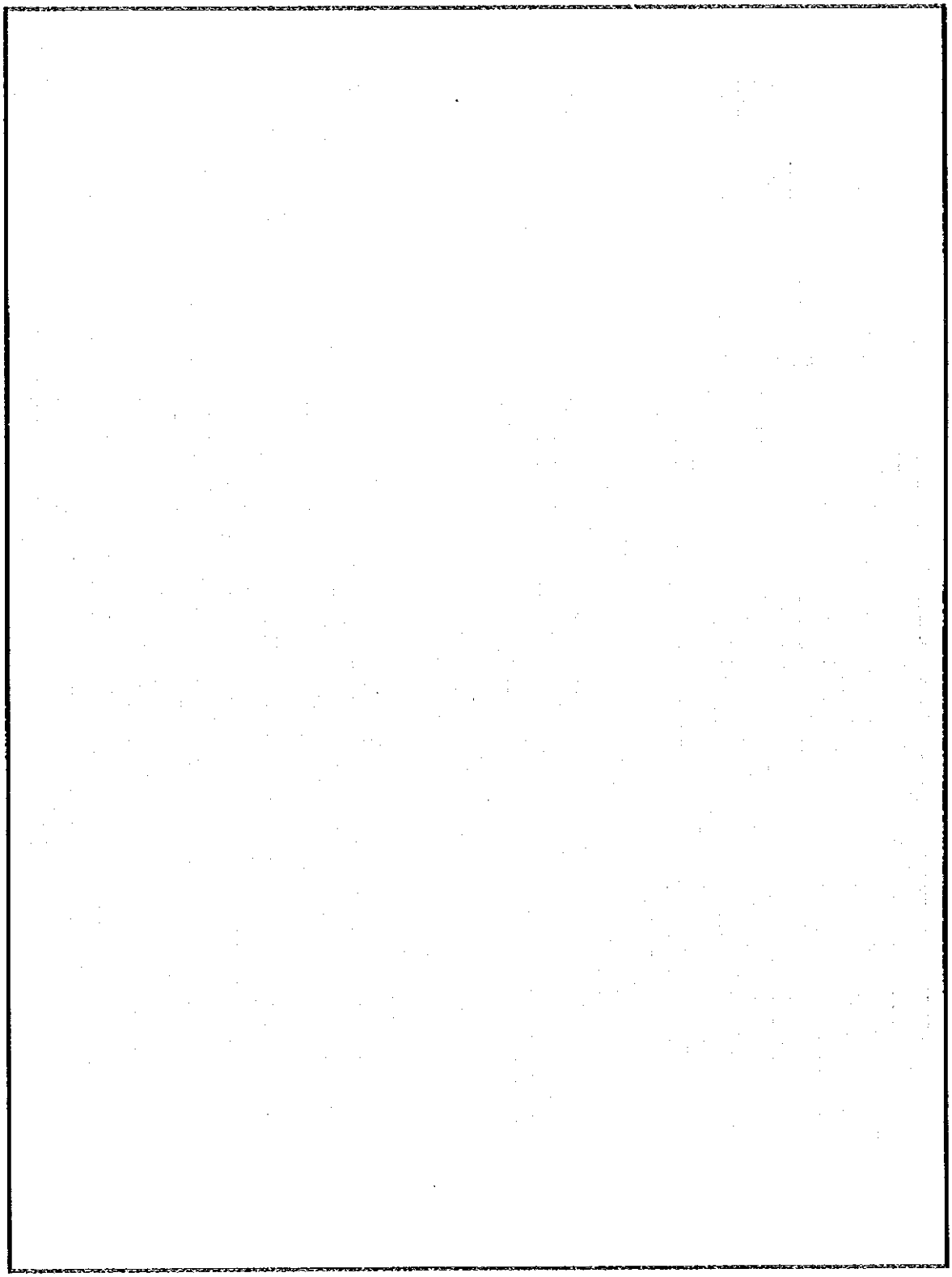
1. Design Period : 5 years
2. Population
   - Annual Growth : 3%
   - Average Household Size : 6 persons/HH
   - Design Population : Present Population x 1.16
3. Per Capita Water Consumption
   - Level II : 60 lpcd
   - Level II with garden : 75 lpcd
   - Level III : 100 lpcd
4. Water Demand
   - Average Day Demand : Design Population X Per Capita Consumption
   - Maximum Day Demand : 1.3 X Average Day Demand
   - Maximum Hour Demand : 2.5 X Average Day Demand
5. Pump Operation
   - Pumping Hours : 8 -15 hours
   - Pumping Rate : Maximum Day Demand/PumpingHrs. = _____
6. Storage Capacity : 1/4 of Average Day Demand
7. System Pressure : 5 - 10 psi at faucet
8. Households Served Per Faucet : 4 - 6 HH

II. Basic Design Data

1. Present Population : _____
2. Design Population (Present Population X 1.16) : _____
3. Average Day Demand: _____ X _____ : _____
   (Per Capita Consumption) (Design Pop.)
4. Maximum Day Demand: 1.3 X _____ : _____
   (Average Day Demand)

Annex 4

SCHEMATIC DIAGRAM OF THE SYSTEM
_____ Rural Water Supply Project



Annex 5

DESIGN OF PIPE LINES

_____ Rural Water Supply Project

SECTION (1)	NODES From (2)	NODES To (3)	SECTION LENGTH(M) (4)	HOUSEHOLD SERVED (5)	PEAKFLOW (LPS) (6)	PIPE DIA (MM) (7)	HEAD LOSS PER 100M (8)	ACTUAL HEADLOSS (9)	REMARK (10)

Annex 6

DESIGN OF RESERVOIR AND PUMP

_____ Rural Water Supply Project

A. DESIGN

1. Determine Capacity of Reservoir, (C_r)

   C_r = 1/4 x Average Day Demand

   C_r = 1/4 x D_a (LPD)

   C_r = _____ liters

2. Determine Minimum Water Elevation, (WL_m)

   WL_m = total head loss + Minimum Pressure in Main (Meters)

   For Barangay System, Min. Pressure = 5 psi (use 3M.)

   For Poblacion System, Min. Pressure = 10 psi (use 7M.)

   WL_m = _____ M.

   Note : The bottom of the storage tank should be higher than this elevation.

B. DESIGN OF PUMP

1. Determine Pump Capacity, Q_p (LPS)

   Q_p = Max. Day Demand (LPD)/ Operating Time (Sec.)

   Q_p = $78 P_d/T$ where: P_d = Design Population

   T = Operating Time in Seconds

   Q_p = _____ LPS

2. Calculate Total Dynamic Head, TDH (Meters)

   TDH = Depth of Pumping Level + by Maximum Reservoir Elevation + friction loss

   TDH = _____ m

3. Calculate Brake Horsepower Requirement :

$$\text{Brake Horsepower} = \frac{Q_p \times TDH}{75 \times \text{Efficiency}}$$

Brake Horsepower = _____ Hp

Where :

Efficiency for Centrifugal Pump, 30-60 %

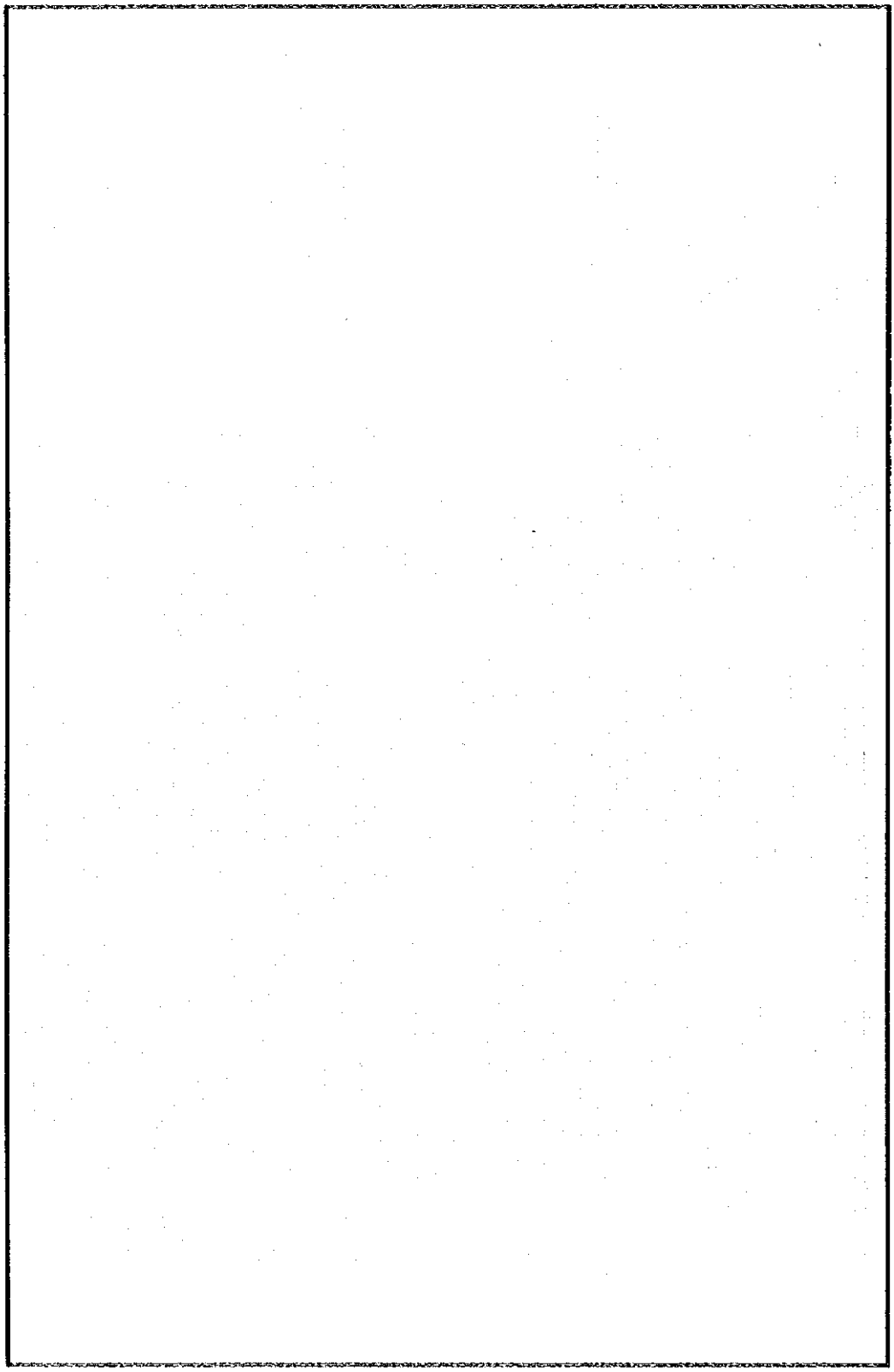
Efficiency for Submersible Pump, 50-60 %

Efficiency for Jetmatic Pump, 20-30 %

Annex 7

DETAILED DESIGN PLAN

_____ Rural Water Supply Project



Annex 8

PIPES SCHEDULE

_____ Rural Water Supply Project

PIPE DIAMETER (1) mm	SECTION LENGTH (2) m	REQUIRED PIPES (3)	ACTUAL NO. OF PIPES (4)	ADDITIONAL PIPES (5)

Annex 9A

FITTINGS SCHEDULE (G.I. PIPES)

_____ Rural Water Supply Project

NODES / SECT LENGTH	COUPLING		UNION PATENTE	TEE STD.	TEE REDUCER	BUSHING REDUCER	ELBOW STD / ELBOW REDUCER	COUPLING REDUCER	FAUCET	NIPPLE	VALVES
	Qty.	Size	Qty.								

Annex 9B

FITTINGS SCHEDULE (PVC PIPES)

_____ Rural Water Supply Project

NODES / SECT LENGTH	SOCKET		STD. / ELBOW REDUCER	STD. / TEE REDUCER	SOCKET ADAPTOR	SOCKET REDUCER	G. I. FITTINGS			OTHERS
	Qty.	Size					VALVES	FAUCET	ELBOW	

Annex 10

BILL OF MATERIALS

_____ Rural Water Supply Project

QUANTITY	UNIT	DESCRIPTION	UNIT COST	TOTAL COST

Annex 11

COST SUMMARY

_____ Rural Water Supply Project

I. ESTIMATED COST OF THE SYSTEM

1. a) Cost of Pipes ₱ _____

   b) Cost of Fittings _____

   Total Cost of Pipes and Fittings ₱ _____

2. Cost of Reservoir _____

3. Cost of Pump _____

4. Labor Cost _____

   a) 10% of Pipes & Fittings (For G.I. Pipes)

   b) 25% of Pipes & Fittings (For PVC Pipes)

5. Cost of Freight and Handling _____

6. Contingencies 5% (Pipes & Fittings - Labor) _____

   Total Cost of the System ₱ _____

For gravity system, omit cost of pump.

II. FINANCIAL DATA

1. Total Cost of the System ₱ _____

2. Local Equity _____

3. Amount of Loan _____

Annex 12

FINANCIAL ANALYSIS

_____ Rural Water Supply Project

A. RELEVANT DATA

1. Pumping Hours : _____ hrs.
2. Pump Horsepower : _____ HP
3. Cost/KWH : ₱_____
4. Pump Cost : ₱_____
5. Amount of Loan : ₱_____
6. Loan Terms : _____ % (interest per annum)
   : _____ years (Repayment Period)
7. Number of Households : _____

B. COMPUTATION OF MONTHLY EXPENSES (Omit non-applicable items)

1. Operations
   a. Salaries _____ x _____ = P _____
   b. Office Supplies _____ x _____ = P _____
   c. Power _____ x _____ = P _____
   d. Chemical _____ x _____ = P _____
   e. Miscellaneous _____ x _____ = P _____

2. Asset Replacement
   a. Pump _____ / _____ = P _____
   Life (mos.)
   b. Pipelines _____ / _____ = P _____
   Life (mos.)
   c. Tank _____ / _____ = P _____
   Life (mos.)
   d. Others _____ / _____ = P _____
   Life (mos.)
3. Amortization _____ x _____ = P _____
   (CRF) (Loan Amt.)
4. Maintenance (2% of Capital Equipt.costs annually)
   .02 X _____ /12 = P _____
6. Total Monthly Expenses = P _____

C. COMPUTATION OF WATER FEE

Monthly Water Fee Per Household :

_____ / _____ = P _____

(Total Monthly Expenses) (No. of HH)

Annex 13

AVAILABILITY OF LOCAL EQUITY

Item	Amount
I. Cash	P _____

II. Labor

Type of Labor	No. of Workers	No. of Days	Rate Per Day	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	_____

III. Materials

Type of Materials	Quantity	Unit Cost	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	_____

TOTAL P _____

I certify that the items listed above represent the local share of the project cost. _____ _____ Association President Date	Noted by : _____ _____ Municipal Sector Liason Date

9.5 Community Development Model

COMMUNITY DEVELOPMENT MODEL STUDY (LEVEL I)
MODEL SITE : BARANGAY CABAYUGAN, SAN ISIDRO, ABRA

1. Socio - Economic Profile of the Model Site

Barangay Cabayugan is one of nine barangays of San Isidro. It is situated 26.75km east-south of Bangued and can be reached through an all-weather road passing through the municipality of Pidigan. The area has hilly topographic expression. Its geological framework is mainly fine-grained sandstone with alternating mud stone.

The area has a population of 306 and 47 households. The barangay is primarily an agricultural area with rice and tobacco as its main crops being produced. Infrastructure facilities located in the barangay include an elementary school and a barangay health station.

2. Present Water Supply and Sanitation Situation

The people presently get their supply of water from two (2) public and three (3) private deep wells. These present water supply sources in the study area are not enough to support the requirements of the residents.

Out of the 47 households, thirty (30) have sanitary toilets, twelve (12) unsanitary and five (5) no toilets. Water-borne diseases are quite prevalent in the area.

3. Institutional Analysis

Although the lack of adequate supply of safe water and of sanitation facilities has long been a problem in the area, there was no previous action on the part of the barangay council and residents to mobilize themselves and discuss ways on improving situation in the area. The only improvement project that was introduced in the community was initiated by the mayor of San Isidro by providing materials for the installation of deep wells in the barangay. However, the production of these wells is not enough to serve the whole area.

Except for the barangay council, no community-based organization (CBO) operates in the area. Lately, however, with the guidance of the municipal government, the barangay council and some

residents have started appraising the situation and have considered the improvement of the area's water supply and sanitation condition. The municipal government has also been supportive of the residents' decision of undertaking water supply and sanitation projects in the area.

4. Future Development Needs

4.1 Potential Source and Service Level

A spring situated about 8 kms from the study area is a potential source. However, considering its distance from the area and minimal number of beneficiaries to be covered, the development of the said spring will be very costly and the project may not be feasible.

Another alternative source is a deep well. For the study area, the construction of two (2) additional deep wells is necessary to augment the present water supply. A gravel packed well with discharge of 0.5 lps is sufficient for Level 1 water system. Based on existing deep wells, a depth of 30 m may be considered for the model site, while water quality analysis must be undertaken.

4.2 Formation of BWSA

Since there is no CBO in the area, the barangay council shall initiate the formation of a Barangay Waterworks and Sanitation Association (BWSA). Households which will benefit from the project will form the core members of the association. The Municipal Sector Liaison (MSL), assisted by the Provincial Sector Team (PST) will provide technical and institutional assistance in forming and developing the capability of the BWSA.

The officers for the BWSA shall be elected as the first step led by barangay council. They shall oversee the construction work as well as the operation and maintenance of the system.

5. Capital and O&M Funds

5.1. Water Source Facility and Sanitary Toilet

Capital cost required to construct a deep well facility is estimated at about P125,000. Total cost of the two wells shall be P250,000. Portion of this amount could be sourced from the AMDAF funds of the provincial and municipal governments. The municipality, guided by the PST, shall assist the community in raising the needed amount.

Capital cost of household toilets shall be shouldered by the owners. If a family is not able to put up the initial capital cost, the association shall make arrangements for the extension of

loan from the Provincial/Municipal Government or other sources (rural bank, cooperatives, etc.). Policies on interest rates and repayment scheme adopted by the source shall prevail. The association will be the guarantor and the collector for this loan.

5.2. Operation and Maintenance

The community should raise an amount equivalent to at least 1% of the capital cost of the water system (in this case it's ₱2,500), which shall be set aside for the operation and maintenance of the deep wells. While operation and maintenance of household toilets shall be done by the owners.

6. Community Involvement

6.1. Pre-Construction (Project Preparation and Planning)

(1) The Barangay Council of Cabayugan, in coordination with the MSL, shall initiate a meeting among the residents to discuss water and sanitation problems and needs in the area. The opportunities in the sector and possible implementation of water and sanitation projects in the barangay can then be discussed.

(2) As a pre-requisite to the availment of assistance, a community organization should be endorsed by the residents. Since there is no CBO in the area, the barangay residents shall organize themselves into BWSA. The elected officers of the BWSA shall discuss the construction of Level I water facilities and provision of individual sanitary toilets to all households.

(3) The association shall determine the monthly fees that the members will contribute to cover all monthly operation, maintenance and administration costs.

(4) The BWSA shall submit a formal request to the MSL, duly endorsed by the Barangay Council, for technical and financial assistance in undertaking Level I project in the area. The request is supplemented by a commitment sheet signed by the association indicating willingness to participate in the project and their responsibility for the operation and maintenance. An initial reserve fund representing the membership fees of beneficiaries will be collected and deposited in a bank.

(5) Upon approval of such a request, the association will mobilize its project team to assist in project implementation and in undertaking the following:

1) Conduct of community study (barangay diagnostics).
2) Identification of sites for the construction of deep wells. Technical assistance shall be sought from MEO/PEO/DEO, as required. The women sector can advise the ideal site.

3) Negotiation for the right of way

(6) Monitoring Activities: During this stage, the association will submit a progress report to MSL indicating the status of project planning and preparation. The report will include such information as the composition and membership of the BWSA, scope of project to be implemented, project specifications, work plan and schedule, and financial arrangement.

6.2. Construction Phase (Project Implementation)

(1) During construction of facilities, the BWSA will assign team/s which shall coordinate and monitor the implementation of the project.

(2) Beneficiaries could provide labor during well construction, pump installation and preparation of drains and soak way pits.

(3) The community may be asked to contribute materials which are locally available. These may take in the form of gravel and sand, roofing sheets, timber or tools for excavation.

(4) The residents should provide information which may be necessary to expedite the construction of the facility.

(5) Monitoring Activities: The BWSA will have discussions with the MSL on the status of the project.

6.3. Post Construction (Operation and Maintenance)

(1) BWSA shall monitor whether the contractor conducts proper disinfecting of the wells immediately after their completion. Also, the association shall request PHO or the Rural Health Unit (RHU) to conduct periodic water quality surveillance and disinfecting wells, as required.

(2) BWSA shall monitor whether the facilities are properly maintained or not.

(3) Beneficiaries should be involved directly in the maintenance of the facilities. They shall practice to keep the premises of the water facilities clean, sanitary and free from excess water. Breakdown should be reported immediately to the BWSA and necessary repair work must be undertaken at once.

(4) Operation and maintenance cost will be shouldered by the beneficiaries through their membership fees. The association shall regularly collect monthly contribution and deposit them in the bank. Expenses for repairs and improvement, spare parts commonly used and other recurrent costs will also be charged out of this fund.

(5) The member-beneficiaries should provide labor in the repair and rehabilitation of the facilities.

(6) Maintenance of household toilets should be the responsibility of the owners.

(7) Monitoring Activities: The BWSA is required to submit annual report to MSL. The first post-construction report should be submitted immediately upon the completion of the project. It should indicate well log data, number of sanitary toilets constructed, overall cost (both for water system and toilets), project modification (if any), and timetable of maintenance activities. Succeeding reports will indicate breakdowns and repairs, expenses, problems encountered in operating the system and, if possible, recommendations, and other relevant data.

7. Project Elements

7.1. Health and Hygiene Education

Health and hygiene education should be launched as early as the initial planning of the project. It would be a good entry point in discussing existing water and sanitation issues in the community prior to the formation of BWSA. The MSL and the RHU, should conduct a continuous health education campaign in the barangay. Special presentations can also be done by the RHU midwife during meetings of the group. New facilities would provide more opportunities to discuss hygiene practices and identify areas for improvement. The barangay elementary school shall adopt DECS' Teacher-Child-Parent Approach which involves parents and other members of the family in teaching practical lessons in hygiene education. This local effort can be reinforced by multi-media campaign being organized by higher government institutions such as the DOH and the Philippine Information Agency.

7.2. Human Resources Development and Training

The members of the BWSA will be trained on basic hand pump operation and maintenance. Workshops and on-the-job training will be conducted by the MSL. Qualified members will be enrolled at the National Manpower and Youth Council (NMYC) which conducts regular training course on Plumbing. Internship of graduates can be arranged with appropriate institutions. Special training shall also be conducted for women to provide them with basic skills in undertaking minor repairs.

7.3. Women's Involvement

The women must be involved from the start of the project and in the operation and maintenance of the facilities. They should therefore be included in training programs conducted for the members. The women sector must also spearhead in health and hygiene education.

COMMUNITY DEVELOPMENT MODEL STUDY (LEVEL II)
MODEL SITE : BARANGAY CABARUAN, DANGLAS, ABRA

1. Socio - Economic Profile of the Model Site

Barangay Cabaruan serves as the town proper of the municipality of Danglas. It is situated 13.97km north-west of Bangued, the capital town of Abra and can be reached through an all-weather road after crossing the Abra river at Calaba, Bangued. The area has a flat to hilly topography and is underlain by mudstone, sandstone, and unconsolidated deposit of clay, silt and gravel.

The area has a population of 545 and 180 households. The main source of livelihood of the residents is farming, although some are engaged in hunting to augment their income. The main products are rice during the wet season and corn during the dry season.

In the study area new Municipal Hall of Danglas has been constructed. An elementary school and a rural health unit are located in the area. Six sari-sari stores exist in the barangay. A "Bigasang-Bayan" also functions being run by the Cabaruan Multi-Purpose Cooperative, Inc. (CMPCI). Houses are made of light materials, coconut lumber, nipa and GI sheet roofing.

2. Present Water Supply and Sanitation Situation

The present supply of domestic water in the area comes from three (3) public deep wells and four (4) private shallow wells in the area, although these are not enough to meet the requirements of the residents. One problem plaguing the area is the lowering of groundwater level, particularly the shallow wells, during dry season.

The municipal government is presently undertaking the construction of a Level II water system with two faucets at strategic locations to serve for the municipal hall and its surrounding residents. A dug well and a spring were developed as the water sources of the system. However, the spring has a very limited discharge rate during dry period. The water is also of dubious quality for drinking. Particularly, the dug well is susceptible to pesticide and fertilizer contamination due to the fact that the well is surrounded by paddy fields. A reservoir has been constructed near the dug well which is only several meters away from the municipal hall.

Almost all of the households in the area have sanitary toilets. Most of these are pour-flush type and the rest VIP latrines. Water-borne diseases are quite prevalent in the area as reported by the Rural Health Unit (RHU).

3. Institutional Analysis

There are various community-based organizations (CBOs) that are active in the area. Some of these are: Timbayog di ti Ina (Mother's Club), Senior Citizens Association, Farmers Association, CMPCI, and the Nagkakaisang Kababaihan sa Layunin Upang Umunlad ang Danglas 2000 (Nakalusuda). However, these organizations focus on issues other than water and sanitation problems.

The residents, on the other hand, have been vigilant about the lack of adequate supply of safe water in the area such that they have been clamoring to the municipal government the need to improve the present situation. They have also signified willingness to cooperate in any water supply and sanitation project to be implemented in the area. The Mayor and members of Sangguniang Bayan are very supportive of all water and sanitation projects.

4. Future Development Needs

4.1. Potential Source

An alternative source for the area is a deep well. A gravel packed well with a capacity of 2.0 lps is necessary to meet the water demand. Development of deep well shall entail detailed groundwater survey to make sure of the source capacity. This must include geo-resistivity survey and water quality test. Another possible source is a spring. Perennial discharge is paramount as well as gravity flow from the spring to the service area in selection of the spring source.

4.2. Level of Service/Scope of Works

Level II water system is appropriate for the barangay serving clusters of houses. Number of faucets shall be determined considering current criteria and possible expansion of service area within source capacity available. The provincial and/or municipal engineering office shall extend the assistance to evaluate the most feasible water source/s. The study and design entail water source development and installation of distribution pipelines.

At the same time, families shall be encouraged to construct individual household toilets.

4.3. Formation of RWSA

The municipal government has conducted initial consultations with residents with regard to the formation of a Rural Waterworks and Sanitation Association (RWSA) which will supervise the implementation of the project as well as operate and manage the Level II system to be constructed in the area. The provincial government, through the PPDO is also providing assistance to this program.

5. Capital and O&M Funds

5.1. Water Supply System

Capital cost required to construct Level II system is estimated at about P600,000 including source development. Of this amount, cost of materials is about 70%, while labor cost accounts for 30%.

The municipal government has initially purchased materials for the construction of the system, although additional cost will be shouldered by the RWSA. To bring down the cost of the system, the community should provide free labor during the construction of the system. They can assist in excavation, pipe laying and installation of faucets. The water charges to be collected by the association from the water consumers will cover costs of operation and maintenance, and loan amortization.

5.2. Household Sanitary Toilets

Capital cost of individual household toilets (pour flush type) shall be shouldered by the home owners. Should a family is not be able to put up the initial capital cost, the RWSA shall make arrangements for the extension of loan from various institutions. Policies on interest rates and repayment scheme adopted by the institutions shall be followed. The association could be the guarantor and the collector for this loan.

5. 3. Operation and Maintenance

As mentioned earlier, the water charges to be collected by the association from the water consumers will cover costs of operation and maintenance. A reserve fund shall be set-up from fees collected monthly for the maintenance cost of the system.

6. Community Involvement

6.1. Pre-Construction (Project Preparation and Planning)

(1) The MSL, in coordination with the PST, shall help the formation of RWSA in Barangay Cabaruan in order to sustain water and sanitation improvement projects and comply with the requirements in acquiring loans for the project.

(2) The community determines the scope of project they would undertake and commits full support to such undertaking. RWSA assigns committees which shall regularly coordinate with the MSL.

(3) The association shall submit a formal request to the municipality for further technical and financial assistance in undertaking the project. The request is supplemented by a commitment sheet signed by the association indicating their willingness to participate in the project and their responsibility for the operation and maintenance. A reserve fund representing the initial contribution/membership fee of beneficiaries will be collected and deposited in a bank.

(4) Upon approval of such request, the association will mobilize its team to assist for the following:

1) preparation of a work plan including time frame and budget;
2) undertaking community study (barangay diagnostics);
3) detailed planning as a baseline for evaluation (technical and social aspects; knowledge, attitudes, practices related to water, sanitation, and hygiene);
4) negotiation for the right of way and lot donation for the sites of communal faucets; and,
5) short listing of local contractor/s for the conduct of bidding

(5) RWSA shall meet with the beneficiaries to set water rates which will be used for the system's loan repayment and for operation and maintenance.

(6) Monitoring Activities: During this stage, the association will submit a progress report to MSL indicating the status of project planning and preparation. The report will include such information as the composition and membership of RWSA, scope of project to be implemented, project specifications, work plan and schedule, and financial arrangement.

6.2. Construction (Project Implementation)

(1) The beneficiaries shall provide self-help labor in the following activities:

1) clearing of the source premises
2) spring development or construction of deep well

3) digging and pipe laying

4) installation of communal faucets and meter

5) preparation of drains and soak way pits

6) excavation of pits and construction of latrine structures

(2) Granting of right of way for pipe laying, construction of pump house and for installation of other necessary facilities.

(3) Dissemination of information on the on-going construction work.

(4) Provision of the access road for contractor/s.

(5) Monitoring Activities: The RWSA will coordinate with MSL on the construction activities. It shall submit a report containing information such as modifications, project team composition, people's contributions (cash, materials and labor), etc.

6.3. Post Construction (Facility Operations)

(1) The RWSA should monitor the practices of the users to ensure proper handling of the water and sanitation facilities as well as prudent use of water. Every member-consumer should also cooperate with RWSA to protect from loss or damage of communal faucets with meters.

(2) The association should assign person/s to regularly monitor the performance of the water source facilities and public faucets. Water samples should be collected periodically in cooperation with Provincial Health Office (PHO) staff.

(3) The members should pay their membership dues/water consumption charges regularly in order to maintain good service of the water system.

(4) Maintenance of individual household toilets shall be the responsibility of the owners.

(5) Monitoring Activities: The association is required to submit quarterly reports to MSL. The first post-construction report should be submitted immediately upon the completion of the project. It should indicate scope of work (water system), sanitary toilets constructed, modifications (if any), overall cost (both for water system and toilets), and timetable of maintenance activities. Succeeding reports will indicate breakdowns and repairs, expenses, problems encountered in operating the system and, if possible, recommendations, and other relevant data.

7. Project Elements

7.1. Health and Hygiene Education

To create awareness among the residents on the value of safe water and sanitary toilet facilities, the RWSA assisted by the MSL shall conduct hygiene education in the project area. The campaign should be launched as early as the commencement of the project. This could be the entry point for the improvement of water and sanitation systems in the area. Moreover, these new facilities provide more opportunities to discuss hygiene practices and identify areas for improvement. The barangay elementary school in the barangay likewise adopts DECS' Teacher-Child-Parent Approach which involves parents and other members of the family in teaching practical lessons in hygiene education.

The efforts of the MSL and the school shall be reinforced by multi-media campaign being implemented by other government institutions such as the DOH and the Philippine Information Agency.

7.2. Human Resources Development and Training

Members of the RWSA will be trained on basic utility operation and maintenance. On-the-job training will be conducted by the MSL. Qualified RWSA members will be enrolled at National Manpower and Youth Council) (NMYC) which conducts technical courses. Internship of graduates can be arranged with the appropriate institutions.

7.3. Women's Involvement

Women must be involved from the start of the project and on the operation and maintenance of the facilities. They should therefore be included in training programs. The women sector must also spearhead in health and hygiene education

COMMUNITY DEVELOPMENT MODEL STUDY (LEVEL III)
MODEL SITE : BARANGAY TANGBAO, SAN ISIDRO, ABRA

1. Socio - Economic Profile of the Model Site

Barangay Tangbao is located at the south of the town proper of San Isidro, about 26km south of Bangued, the capital town of Abra. The area can be reached through an all-weather gravel road. It has an undulating topography resting on a valley. The area is underlain by indurated sandstone, siltstone and mudstone.

The study area has a population of 554 and 110 households. Basically, the barangay is a farming area. The major agricultural products in the area are rice during the rainy season and tobacco during the dry season. The area produces around 30,000 kgs of Virginia tobacco annually. Other major products are mango, corn and livestock (cattle, goat, hog). The average annual household income is placed at ₱30,000.

The barangay has a primary school (Grade 1-3) located at sitio Kimalasag. Intermediate (Grade 4-6) pupils go to the adjacent Barangay Langbaban Elementary School which is 1km north of Tangbao. There is also a Catholic Chapel in the area.

2. Present Water Supply and Sanitation Situation

Presently, the study area has nine (9) deep wells (30-35 meters deep), three of which are privately owned and the rest are public. In all the existing deep wells, water is extracted through hand pumps and the supply of water is perennial.

All of the households in the area have toilet facilities as a result of a barangay ordinance requiring each household to have a toilet. However, about ten (10) are not sanitary (antipolo type). The area, being hilly, has a good drainage system.

3. Institutional Analysis

The residents of Barangay Tangbao have signified interest to upgrade the existing water service level (Level I) to Level III and the barangay council has endorsed this move. Even the municipal government has expressed full support to this proposal. The town mayor has

pledged initial grant if the people could not raise the full amount needed to develop the system. The barangay council and the municipal government have submitted requests to the provincial government for possible inclusion of the project in the Provincial Development Investment Program. A preliminary investigation of the spring water source and the project area has been done by PPDO's Technical Team.

Also, the barangay council and the community residents, with seedlings from DENR, has started planting the watershed with mahogany and other species.

Since there are no active community-based organizations (CBOs) or NGOs in the area, the community residents are willing to organize a Rural Waterworks and Sanitation Association (RWSA) and to pay minimal monthly due for operation and maintenance.

4. Future Development Needs

4.1 Potential Source and Service Level

Level III water system is appropriate for the project area composed of a piped distribution system with individual household connections.

The proposed water source by the community is a dug well (8m long x 6m wide x 4m depth) which was dug into weathered fine-grained sandstone. However, the source is susceptible to surface pollutants such as pesticides and fertilizer and the priority use of the water is given for watering tobacco.

Deep well is an alternative water source for the proposed Level III system. A detailed investigation must be conducted prior to the implementation. This should include geo-resistivity survey to determine the approximate depth of the deep well and water quality analyses.

Another possible source is a spring which is found in the eastern and western sections of the barangay. Spring discharges should be surveyed to determine available flows.

Comparative analysis of the costs of investment, operation, replacement and depreciation on the two possible sources should be undertaken to determine the most feasible source.

4.2. Formation of RWSA

The barangay residents have manifested their willingness to organize their own RWSA which shall be responsible for the operation and maintenance of the water supply system and in implementing sanitation programs in the community.

5. Capital and O&M Funds

5.1. Water System

(1) Capital cost required to construct the Level III system for the barangay will be determined after the conduct of feasibility study and detailed design thereafter. However, based on assessments on the requirements in the area, the initial investment cost to develop the system is estimated at about ₱2,000,000.

(2) The capital cost will be shouldered by the association (the water users) through a loan secured from the municipal/provincial government or other funding sources. Water charges will be collected from the consumers to cover the cost of loan amortization and expenses for the operation and maintenance of the system.

5.2. Individual Sanitary Toilets

Capital cost of household toilets shall be shouldered by the home owners. If a family is not able to put up the capital cost, the association or other funding sources shall extend loan to them.

6. Community Involvement

6.1. Pre-Construction (Project Planning and Preparation)

(1) The barangay residents shall hold a general assembly-meeting to discuss the proposed project and organize the RWSA which shall assume the management, operation and maintenance of the water supply system and the promotion of sanitation activities. Members of the association shall be the concessionaires.

(2) The water association shall elect its officers who will supervise its day-to-day operation. The Municipal Sector Liaison (MSL) with the support of the Provincial Water Task Force/Provincial Sector Team (PWTF/PSPT) shall provide technical assistance.

(3) The members shall pay their initial membership dues.

(4) The association shall request the MSL for technical assistance in determining the scope of water and sanitation project they shall undertake.

(5) The association submits a formal request to the municipal and/or provincial government for the necessary financial loan in undertaking the project. The request is supplemented by a commitment sheet signed by the association indicating their willingness to pay for the water charges/fees and their responsibility for operation and maintenance.

(6) Upon approval of the loan request, the association will mobilize its own team for the following:

1) conduct of feasibility studies
2) negotiation for the acquisition of the right of way
3) design of the system
4) bidding of the project
5) project mobilization

(7) The members shall also attend all briefings and presentations related to the project

(8) Monitoring: During this stage, the association shall submit a progress report to the MSL indicating the status of project planning and preparation. The report will include, among others, the composition and membership of RWSA, scope of project to be implemented, project specifications, work plan and schedule, delineation of responsibilities, and financial arrangements.

6.2. Construction (Project Implementation)

(1) The beneficiaries (RWSA) shall provide self-help labor for the construction of the water system. A qualified contractor shall be hired to supervise the construction works.

(2) Other direct involvement of the residents/beneficiaries shall be the following:

1) Granting of right of way for pipe laying, construction of pump house and installation of other necessary facilities
2) Dissemination of information on the construction activities
3) Compliance with temporary traffic rerouting plans
4) Provision of access road for contractor/s
5) Monitoring of inconveniences caused by the construction
6) Early application for water connections

(2) Monitoring: The contractor will furnish the association with progress reports on the status of the construction project. The report shall include any modification, problems being

encountered and possible solutions. The association shall furnish the MSL or PST with the consolidated report

6.3. Post Construction (Operation and Maintenance)

(1) The facilities shall be operated and maintained by highly-trained personnel and technicians to be assigned by the association. However, the users should participate in the operation and maintenance of the systems through the following:

1) Paying of water bills on time
2) Reporting of water leaks at the main pipeline
3) Giving access to meter readers
4) Conservation of water
5) Campaign for more service connections.
6) Reporting of illegal connections, tampering of water meters and busted pipes
7) Monitoring of water quality
8) Attending at association meetings and other activities

(2) The association shall assist in the maintenance of the premises of facilities.

(3) Maintenance of individual household toilets shall be the responsibility of the owners.

(4) Monitoring Activities: The association shall submit quarterly reports to the MSL. The first post-construction report should be submitted immediately upon the completion of the project. It should indicate scope of work (water system), number and type/s of sanitary toilets constructed, modifications (if any), overall cost (both for water system and toilets), and timetable of maintenance activities. Succeeding reports will indicate number of connections, breakdowns and repairs, expenses, problems encountered in operating the system and, if possible, recommendations, and other relevant data.

7. Project Elements

7.1. Health and Hygiene Education

Health and hygiene education should be launched as early as the initial planning of the project. It would be a good entry point in discussing existing water and sanitation issues in the community prior to the formation of the association. The MSL, together with the Rural Health Unit (RHU) should conduct a continuous health education campaign in the barangay. Special presentations can also be done by the RHU staff during meetings of the group. New

facilities would provide more opportunities to discuss hygiene practices and identify areas for improvement.

These efforts can be reinforced by multi-media campaign being organized by higher government institutions such as the DOH and the Philippine Information Agency to be coordinated by the provincial/municipal staff. Also, selected public schools in the municipality adopt DECS' Teacher-Child-Parent Approach which involves parents and other members of the family in teaching practical lessons in hygiene education.

7.2. Human Resources Development and Training

Training and human resource development programs shall be directed to those who would manage, operate and maintain the water systems. The officers and management staff of the association shall be sent to provincial government and/or other relevant central government agencies to attend basic and advanced training programs such as policy making, financial management, systems design, construction supervision, among others.

Qualified members will also be enrolled at the National Manpower and Youth Council (NMYC) which conducts water supply-related courses. Internship of graduates can be arranged with the municipal/provincial government, the water district or other appropriate institutions.

7.3. Women's Involvement

The association should campaign for female members and give them equal opportunity in the board and in the management of the system They must be involved from the start of the project and in operation and maintenance of the facilities. They should therefore be included in training programs conducted for the members. The women sector must likewise spearhead in health and hygiene education campaign in the community.

10. COST ESTIMATES FOR FUTURE SECTOR DEVELOPMENT

10.2 Assumptions for Cost Estimates

10.2.1 Unit Construction Cost

Table 10.2.1 Unit Cost of Level I (Deep Well - 30m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		3,300
B. Drilling of Well & Installation of Steel Casing/Screen				
1. Materials				
(1) 100mm x 3m Steel Casing with coupling	7	pcs.	2,625	18,375
(2) 100mm x 3m Steel Casing with one end closed	1	pc.	2,719	2,719
(3) 100mm x 3m Low Carbon Steel Screen	2	pcs.	4,313	8,626
2. Labor, Fuel, Lubricant and others				
Well Drilling for 30 m depth at 200mm borehole	30	m	1,100	33,000
3. Freight Cost (9% of Materials)		L.S.		2,675
Sub-Total of B				**65,395**
C. Well Development		L.S.		5,000
D. Gravel Packing, Installation of Handpump and Construction of Platform				
1. Materials				
(1) Improved Deep Well Cylinder Pump (Malawi Type)	1	set	9,000	9,000
(2) 63mm x 6m GI Pipe with coupling	4	pcs.	1,706	6,824
(3) #10 Sieved Gravel	0.53	cu.m	870	461
(4) Coarse Sand	1	cu.m	304	228
(5) Cement for Sanitary Seal	3	bags	117	351
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800mm)	6	pcs.	45	270
6) Nail	1	kg.	32	32
Sub-Total of D-1				18,958
2. Labor (40% of D-1.)		L.S.		7,583
3. Freight Cost (9% of Materials)		L.S.		1,706
Sub-Total of D				**28,247**
E. Indirect Cost				
Profit (10% of A, B, C & D)		L.S.		10,194
VAT (14% of Profit & Labor)		L.S.		7,109
Sub-Total of E				**17,303**
Total of Construction Cost (A+B+C+D+E)				**119,245**
F. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		3,000
2. Construction Supervision		L.S.		2,000
3. Water Quality Analysis		L.S.		1,088
Sub-Total of F				**6,088**
GRAND TOTAL				**125,333**
SAY				**125,300**

Note: L.S. - Lump Sum
Source: DPWH standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.2 Unit Cost of Level I (Deep Well - 50m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		3,300
B. Drilling of Well & Installation of Steel Casing/Screen				
1. Materials				
(1) 100mm x 3m Steel Casing with coupling	14	pcs.	2,625	36,750
(2) 100mm x 3m Steel Casing with one end closed	1	pc.	2,719	2,719
(3) 100mm x 3m Low Carbon Steel Screen	2	pcs.	4,313	8,626
2. Labor, Fuel, Lubricant and others				
Well Drilling for 50 m depth at 200mm borehole	50	m	1,100	55,000
3. Freight Cost (9% of Materials)		L.S.		4,329
Sub-Total of B				**107,424**
C. Well Development		L.S.		5,000
D. Gravel Packing, Installation of Handpump and Construction of Platform				
1. Materials				
(1) Improved Deep Well Cylinder Pump (Malawi Type)	1	set	9,000	9,000
(2) 63mm x 6m GI Pipe with coupling	6	pcs.	1,706	10,236
(3) #10 Sieved Gravel	1.0	cu.m	870	870
(4) Coarse Sand	1	cu.m	304	192
(5) Cement for Sanitary Seal	3	bags	117	351
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800mm)	6	pcs.	45	270
6) Nail	1	kg.	32	32
Sub-Total of D-1				22,743
2. Labor (40% of D-1.)		L.S.		9,097
3. Freight Cost (9% of Materials)		L.S.		2,047
Sub-Total of D				**33,887**
E. Indirect Cost				
Profit (10% of A, B, C and D)		L.S.		14,961
VAT (14% of Profit & Labor)		L.S.		11,068
Sub-Total of E				**26,029**
Total of Construction Cost (A+B+C+D+E)				**175,640**
F. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		3,000
2. Construction Supervision		L.S.		2,000
3. Water Quality Analysis		L.S.		1,088
Sub-Total of F				**6,088**
GRAND TOTAL				**181,728**
SAY				**181,700**

Note: L.S. - Lump Sum

Source: DPWH standard price in 1994

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.3 Unit Cost of Level I (Deep Well - 70m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		**L.S.**		**3,300**
B. Drilling of Well & Installation of Steel Casing/Screen				
1. Materials				
(1) 100mm x 3m Steel Casing with coupling	21	pcs.	2,625	55,125
(2) 100mm x 3m Steel Casing with one end closed	1	pc.	2,719	2,719
(3) 100mm x 3m Low Carbon Steel Screen	2	pcs.	4,313	8,626
2. Labor, Fuel, Lubricant and others				
Well Drilling for 70 m depth at 200mm borehole	70	m	1,100	77,000
3. Freight Cost (9% of Materials)		L.S.		5,982
Sub-Total of B				**149,452**
C. Well Development		**L.S.**		**5,000**
D. Gravel Packing, Installation of Handpump and Construction of Platform				
1. Materials				
(1) Improved Deep Well Cylinder Pump (Malawi Type)	1	set	9,000	9,000
(2) 63mm x 6m GI Pipe with coupling	9	pcs.	1,706	15,354
(3) #10 Sieved Gravel	1.5	cu.m	870	1,305
(4) Coarse Sand	1	cu.m	385	231
(5) Cement for Sanitary Seal	3	bags	117	351
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800mm)	6	pcs.	45	270
6) Nail	1	kg.	32	32
Sub-Total of D-1				28,335
2. Labor (40% of D-1.)		L.S.		11,334
3. Freight Cost (9% of Materials)		L.S.		2,550
Sub-Total of D				**42,219**
E. Indirect Cost				
Profit (10% of A, B, C and D)		L.S.		19,997
VAT (14% of Profit & Labor)		L.S.		15,166
Sub-Total of E				**35,163**
Total of Construction Cost (A+B+C+D+E)				**235,134**
F. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		3,000
2. Construction Supervision		L.S.		2,000
3. Water Quality Analysis		L.S.		1,088
Sub-Total of F				**6,088**
GRAND TOTAL				**241,222**
SAY				**241,200**

Note: L.S. - Lump Sum
Source: DPWH standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.4 Unit Cost of Level I (Deep Well Rehabilitation)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		**L.S.**		**3,300**
B. Well Rehabilitation				
1. Materials				
(1) Cylinder Pump Set	1	set	9,000	9,000
(2) Cement for Surface Sealing	4	bags	117	468
(3) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	2	cu.m	385	770
3) Sand	1	cu.m	304	304
4) Plywood (4' x 8' x 1/4")	1	pc.	250	250
5) Form Lumber (2" x 3" x 6")	6	pcs.	45	270
6) Nail	1	kg.	32	32
Sub-Total of B-1				11,562
2. Labor (40% of B-1)		L.S.		4,625
3. Freight Cost (9% of Materials)		L.S.		1,041
Sub-Total of B				**17,228**
C. Well Development		**L.S.**		**6,500**
D. Indirect Cost				
Profit (10% of A, B & C)		L.S.		2,703
VAT (14% of Profit & Labor)		L.S.		1,936
Sub-Total of D				**4,639**
Total of Construction Cost (A+B+C+D)				**31,667**
E. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		1,100
2. Supervision		L.S.		650
3. Water Quality Analysis		L.S.		1,088
Sub-Total of E				**2,838**
GRAND TOTAL				**34,505**
SAY				**34,500**

Note: L.S. - Lump Sum

Source: DPWH standard price in 1994

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.5 Unit Cost of Level I (Shallow Well - 18m Depth)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		1,100
B. Drilling of Well & Installation of Steel Casing/Screen				
1. Materials				
(1) 50mm x 6m PVC Pipe with socket	2	pcs.	813	1,626
(2) 50mm x 3m PVC Pipe with plug	1	pc.	410	410
(3) 50mm PVC Socket	1	pc.	90	90
(4) 50mm x 3m PVC Screen	1	pc.	1,300	1,300
2. Labor, Fuel, Lubricant and others				
Well Drilling for 18 m depth at 150mm borehole	18	m	520	9,360
3. Freight Cost (9% of Materials)		L.S.		308
Sub-Total of B				**13,094**
C. Well Development		L.S.		500
D. Gravel Packing, Installation of Handpump and Construction of Platform				
1. Materials				
(1) 50mm Jetmatic Handpump	1	set	2,380	2,380
(2) 50mm x 1m GI Pipe (Sch. 40)	1	pc.	75	75
(3) #10 Sieved Gravel	0.1	cu.m	870	87
(4) Coarse Sand	0.07	cu.m	304	21
(5) Cement for Sanitary Seal	1	bag	117	117
(6) Pump Base and Platform				
1) Cement	4	bags	117	468
2) Gravel	1	cu.m	385	385
3) Sand	1	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1	pc.	250	250
5) Form Lumber (50mm x 75mm x 1,800 mm)	1	pc.	45	45
6) Nail	1	kg.	32	32
Sub-Total of D-1				4,164
2. Labor (40% of D-1.)		L.S.		1,666
3. Freight Cost (9% of Materials)		L.S.		375
Sub-Total of D				**6,205**
E. Indirect Cost				
Profit (10% of A, B, C & D)		L.S.		2,090
VAT (14% of Profit & Labor)		L.S.		1,836
Sub-Total of E				**3,926**
Total of Construction Cost (A+B+C+D+E)				**24,825**
F. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		2,000
2. Construction Supervision		L.S.		1,500
3. Water Quality Analysis		L.S.		1,088
Sub-Total of F				**4,588**
GRAND TOTAL				**29,413**
SAY				**29,400**

Note: L.S. - Lump Sum
Source: DPWH standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.6 Unit Cost of Level I (Spring Development - 90 Service Population)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		3,000
B. Construction of Spring Box				
1. Materials		L.S.		18,000
2. Labor (30% of 1.)		L.S.		5,400
3. Freight Cost (9% of Materials)		L.S.		1,620
Sub-Total of B				**25,020**
C. Installation of Pipelines & Fittings				
1. Materials				
(1) Transmission Main				
1) 38mm dia. GI Pipe, Sch. 40 w/coupling	165	pcs.	340	56,100
2) 38mm dia. GI Gate Valve	2	pcs.	410	820
(2) Communal Faucet				
1) 38mm dia. x 13mm dia. Reducing Socket	1	pc.	70	70
2) 13mm dia. x 150mm GI Nipple	1	pc.	25	25
3) 13mm dia. Brass Faucet	1	pc.	41	41
4) Cement	0.50	bag	148	74
5) Gravel	0.25	cu m	475	119
6) Sand	0.12	cu m	375	45
Sub-Total of Materials				57,294
2. Labor (30% of Material Cost)		L.S.		17,188
3. Freight Cost (9% of Materials)		L.S.		5,156
Sub-Total of C				**79,638**
D. Indirect Cost				
1. Pipe Installation				
(1) Profit (10% of C-1)		L.S.		5,729
(2) VAT (10% of Profit and Labor)		L.S.		2,292
2. Source Facilities				
(1) Profit (10% of A and B)		L.S.		2,802
(2) VAT (14% of Profit and Labor)		L.S.		1,148
Sub-Total of D				**11,971**
Total Construction Cost (A+B+C+D)				**119,629**
E. Estimated Government Expenses				
1. Preliminary & Detailed Engineering and RWSA Formation		L.S.		2,000
2. Supervision		L.S.		12,000
3. Water Quality Analysis		L.S.		1,088
Sub-Total of E				**15,088**
Total Estimated Cost				**134,717**
Unit Cost per Person Served				**1,497**
			Say	1,500

Note: L.S. - Lump Sum
Source: DPWH standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.7 Unit Cost of Level II (600 Service Population)

Sheet-1

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		3,000
B. Construction of Spring Box				
1. Materials		L.S.		36,300
2. Labor (30% of 1.)		L.S.		10,890
3. Freight Cost (9% of Materials)		L.S.		3,267
Sub-Total of B				**50,457**
C. Installation of Pipelines & Fittings				
1. Transmission Main				
(1) Materials				
1) 63mm dia. PVC Pipe (Class 12.5 with pusher type socket)	330	pcs.	813	268,290
2) 63mm dia. Tee	1	no.	88	88
3) Solvent Cement	26	cans	46	1,196
4) 63mm dia. x 150mm Nipple	3	nos.	136	408
5) 63mm dia. Union Patente	1	pc.	173	173
6) 63mm dia. x 50mm dia. Reducing Socket	2	pcs.	105	210
7) 63mm dia. Elbow (90 deg.)	1	pc.	76	76
8) 63mm dia. Elbow (45 deg.)	1	pc.	75	75
9) 63mm dia. Gate Valve	3	pcs.	763	2,289
Sub-Total of Materials				272,805
(2) Labor (30% of Material Cost)		L.S.		81,842
(3) Freight Cost (9% of Materials)		L.S.		24,552
Sub-Total of Transmission Main				379,199
2. Distribution Pipeline				
(1) Materials				
1) 50mm dia. PVC Pipe (Class 12.5 with pusher type socket)	20	pcs.	450	9,000
2) 38mm dia. PVC Pipe (Class 12.5 with pusher type socket)	30	pcs.	300	9,000
3) 20mm dia. PVC Pipe (Class 40 with pusher type socket)	10	pcs.	100	1,000
4) 13mm dia. x 1 m Stand Pipe	10	pcs.	94	940
5) Solvent Cement	4	cans	46	184
6) Fittings				
a. 50mm dia. x 150mm PVC Nipple	3	pcs.	125	375
b. 32mm dia. x 150mm PVC Nipple	3	pcs.	76	228
c. 13mm dia. x 150mm GI Nipple	40	pcs.	25	1,000
d. 50mm dia. Union Patente	1	pcs.	163	163
e. 32mm dia. Union Patente	2	pcs.	71	142
f. 13mm dia. Union Patente	10	pcs.	25	250
g. 50mm dia. x 32mm dia. Reducing Socket	6	pcs.	90	540
h. 32mm dia. x 20mm dia. Reducing Socket	10	pcs.	70	700
i. 20mm dia. x 13mm dia. Reducing Socket	10	pcs.	55	550
j. 50mm dia. PVC Elbow (90 deg.)	2	pcs.	68	136
k. 13mm dia. GI Elbow (90 deg.)	20	pcs.	13	260
l. 20mm dia. x 13mm dia. Socket Adaptor	10	pcs.	41	410
m. 50mm dia. GI Gate Valve	2	pcs.	671	1,342
n. 32mm dia. GI Gate Valve	2	pcs.	380	760
o. 13mm dia. GI Gate Valve	24	pcs.	230	5,520
p. 13mm dia. Brass Faucet	24	pcs.	41	984
q. 50mm dia. Tee	4	pcs.	130	520
r. 32mm dia. Tee	6	pcs.	110	660
s. Water Meter	24	pcs.	750	18,000
t. Water Meter Box	24	pcs.	1,100	26,400
Sub-Total of Materials				79,064
(2) Labor (30% of Material Cost)		L.S.		23,719
(3) Freight Cost (9% of Materials)		L.S.		7,116
Sub-Total of Distribution Pipeline				109,899
Sub-Total of C				**489,098**

Table 10.2.7 Unit Cost of Level II (600 Service Population)

Sheet-2 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
D. Indirect Cost				
1. Transmission Main				
(1) Profit (10% of C-1)		L.S.		37,920
(2) VAT (10% of Profit and Labor)		L.S.		11,976
2. Source Facilities and Distribution Pipeline				
(1) Profit (10% of A, B, C-2)		L.S.		16,336
(2) VAT (14% of Profit and Labor)		L.S.		7,132
Sub-Total of D				**73,364**
Total Construction Cost (A+B+C+D)				**615,919**
E. Estimated Government Expenses				
1. Preliminary & Detailed Engineering and RWSA Formation		L.S.		2,000
2. Supervision		L.S.		12,000
3. Water Quality Analysis		L.S.		1,088
Sub-Total of E				**15,088**
Total Estimated Cost				**631,007**
Unit Cost per Person Served				**1,052**
			Say	**1,100**

Note: L.S. - Lump Sum
Source: DPWH standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.8 Unit Cost of Level III (5,000 Service Population)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		300,000
B. Source Development and Storage				
1. Deep Well	1	No.	1,540,000	1,540,000
2. Deep Well Pump	1	No.	550,000	550,000
3. Chlorinator House & Equipment	1	L.S.		440,000
4. Storage Tank (250 cu.m)	1	No.	1,100,000	1,100,000
Sub-Total of B				**3,630,000**
C. Transmission Main				
1. 160mm dia.	500	L.M.	1,120	560,000
Sub-Total of C				**560,000**
D. Distribution Main				
1. 160mm dia.	1,000	L.M.	1,120	1,120,000
2. 110mm dia.	3,000	L.M.	925	2,775,000
3. 90mm dia.	3,000	L.M.	580	1,740,000
4. 75mm dia.	5,000	L.M.	540	2,700,000
Sub-Total of D				**8,335,000**
E. Service Connections	**1,000**	Nos.	**1,940**	**1,940,000**
F. Miscellaneous				
1. Vehicle	1	No.	550,000	550,000
2. Office & Workshop Bldg.	1	No.	550,000	550,000
3. Office Equipment		L.S.		100,000
4. Tools and Spare Parts		L.S.		100,000
Sub-Total of F				**1,300,000**
Total Direct Cost (A+B+C+D+E+F)				**16,065,000**
G. Indirect Cost (25% of Direct Cost)		L.S.		**4,016,250**
Total Estimated Cost				**20,081,250**
Unit Cost per Person Served				
For New Construction				4,016
			Say	4,000
For Expansion of Existing System (Exclude F.)				3,691
			Say	3,700

Note: L.S. - Lump Sum
Source: LWUA standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.9 Unit Cost of Level III (10,000 Service Population)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		**L.S.**		**300,000**
B. Source Development and Storage				
1. Deep Well	1	No.	1,540,000	1,540,000
2. Deep Well Pump	1	No.	550,000	550,000
3. Chlorinator House & Equipment	1	L.S.		440,000
4. Storage Tank (250 cu.m)	1	No.	1,100,000	1,100,000
Sub-Total of B				**3,630,000**
C. Transmission Main				
1. 160mm dia.	500	L.M.	1,120	560,000
Sub-Total of C				**560,000**
D. Distribution Main				
1. 160mm dia.	2,000	L.M.	1,120	2,240,000
2. 110mm dia.	5,000	L.M.	925	4,625,000
3. 90mm dia.	6,000	L.M.	580	3,480,000
4. 75mm dia.	8,000	L.M.	540	4,320,000
Sub-Total of D				**14,665,000**
E. Service Connections	**2,000**	**Nos.**	**1,940**	**3,880,000**
F. Miscellaneous				
1. Vehicle	1	No.	550,000	550,000
2. Office & Workshop Bldg.	1	No.	550,000	550,000
3. Office Equipment		L.S.		100,000
4. Tools and Spare Parts		L.S.		100,000
Sub-Total of F				**1,300,000**
Total Direct Cost (A+B+C+D+E+F)				**24,335,000**
G. Indirect Cost (25% of Direct Cost)		**L.S.**		**6,083,750**
Total Estimated Cost				**30,418,750**
Unit Cost per Person Served				
For New Construction				3,042
			Say	**3,000**
For Expansion of Existing System (Exclude F.)				2,879
			Say	**2,900**

Note: L.S. - Lump Sum
Source: LWUA standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.10 Unit Cost of Level III (15,000 Service Population)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization/Demobilization		L.S.		300,000
B. Source Development and Storage				
1. Deep Well	2	No.	1,540,000	3,080,000
2. Deep Well Pump	2	No.	550,000	1,100,000
3. Chlorinator House & Equipment	2	L.S.		440,000
4. Storage Tank (250 cu.m)	2	No.	1,100,000	2,200,000
Sub-Total of B				**6,820,000**
C. Transmission Main				
1. 160mm dia.	1,000	L.M.	1,120	1,120,000
Sub-Total of C				**1,120,000**
D. Distribution Main				
1. 160mm dia.	3,000	L.M.	1,120	3,360,000
2. 110mm dia.	7,000	L.M.	925	6,475,000
3. 90mm dia.	9,000	L.M.	580	5,220,000
4. 75mm dia.	11,000	L.M.	540	5,940,000
Sub-Total of D				**20,995,000**
E. Service Connections	**3,000**	**Nos.**	**1,940**	**5,820,000**
F. Miscellaneous				
1. Vehicle	1	No.	550,000	550,000
2. Office & Workshop Bldg.	1	No.	550,000	550,000
3. Office Equipment		L.S.		100,000
4. Tools and Spare Parts		L.S.		100,000
Sub-Total of F				**1,300,000**
Total Direct Cost (A+B+C+D+E+F)				**36,355,000**
G. Indirect Cost (25% of Direct Cost)		**L.S.**		**9,088,750**
Total Estimated Cost				**45,443,750**
Unit Cost per Person Served				
For New Construction				3,030
			Say	3,000
For Expansion of Existing System (Exclude F.)				2,921
			Say	2,900

Note: L.S. - Lump Sum
Source: LWUA standard price in 1994
Unit Cost: Adjusted to 1995 Price Level

Table 10.2.11 Unit Cost of Flush Water Sealed with Septic Tank Toilet

Sheet 1 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Demolition		**L.S.**		**1,000**
B. Earthwork				
1. Materials				
(1) Gravel Fill	1	cu.m.	385	385
Sub-Total of B-1				385
2. Labor				
(1) Excavation	6	cu.m.	119	714
(2) Backfill	2	cu.m.	108	216
(3) Gravel Fill	1	cu.m	141	141
Sub-Total of B-2				1,071
Sub-Total of B				**1,456**
C. Walls & Posts				
1. Materials				
(1) 0.15 x 0.20 x 0.40 Ord. CHB	180	pcs.	6	1,080
(2) Cement	17	bags	117	1,989
(3) Sand	2	cu.m	304	608
(4) Rebars: 12 mm dia. x 6.0 m	5	pcs.	68	340
10 mm dia. x 6.0 m	2	pcs.	49	98
(5) #16 Tie Wire	1	kg.	49	49
(6) Scaffolding:				
10-2" x 4" x 8" (Ord. Lumber)	53	bf.	32	1,696
Sub-Total of C-1				5,860
2. Labor (30% of C-1)		L.S.		1,758
Sub-Total of C				**7,618**
D. Roofing Work				
1. Materials				
(1) GA #26 Corr. GI (L=3.0 m)	3	bd.ft.	274	822
(2) GA #26 Plain GI Flushing	1	pc.	264	264
(3) GA # 24 Plain GI Gutter	1	pc.	264	264
(4) Roof Nails	2	kgs.	44	88
(5) Rafter - 2" x 5 x 10', 4 pcs.	33.33	bd.ft	32	1,067
(6) Purlins - 2" x 2" x 12', 3 pcs.	12	bd.ft	32	384
(7) Wood Cleats - 2" x 2" x 12', 1 pc.	3.33	bd.ft	32	107
(8) Nailers - 2" x 2" x 12', 5 pcs.	20	bd.ft	32	640
2" x 2" x 10', 5 pcs.	20	bd.ft	32	640
(9) Fascia Board - 1" x 12" x 18', 2 pcs.	36	bd.ft	32	1,152
(10) Common Wire Nails (Assorted)	3	kgs.	29	87
(11) Downspout (PVC)				
75 mm dia. x 3.0 m	2	pcs.	81	162
(12) Elbow (PVC) - 75 mm dia.	2	pcs.	15	30
(13) Coupling (PVC) - 75 mm dia.	1	pc.	14	14
Sub-Total of D-1				5,721
2. Labor (30% of D-1)		L.S.		1,716
Sub-Total of D				**7,437**

Table 10.2.11 Unit Cost of Flush Water Sealed with Septic Tank Toilet

Sheet 2 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
E. Plumbing				
1. Materials				
(1) Water Closet	1	set	2,000	2,000
(2) Water line and sanitary fixtures with septic tank		L.S.		6,192
Sub-Total of E-1				8,192
2. Labor (30% of E-1)		L.S.		2,458
Sub-Total of E				**10,650**
F. Carpentry Work				
1. Materials				
(1) Flush Type Door w/Lower Jambs	1	pc.	1,428	1,428
(2) Windows (wooden jalousy) w/Jambs	2	sets	298	596
Sub-Total of F-1				2,024
2. Labor (30% of E-1)		L.S.		607
Sub-Total of F				**2,631**
G. Freight Cost (9% of Materials for B-F excluding indigenous materials)		**L.S.**		**1,575**
H. Indirect Cost				
Profit (10% of A - G)		L.S.		3,237
VAT (14% of Profit & Labor)		L.S.		1,519
Sub-Total of H				**4,756**
Total of Construction Cost (A+B+C+D+E+F+G+H)			**Say**	**37,123** **37,100**

Source: DOH standard price in1993.

Unit Cost: Adjusted to 1995 Price Level.

Table 10.2.12 Unit Cost of Pour Flush with Double Pit Latrine

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Earthwork				
1. Materials				
(1) Gravel Fill	1	cu.m.	385	385
Sub-Total of A-1				385
2. Labor				
(1) Excavation	6	cu.m.	119	714
(2) Backfill	2	cu.m.	108	216
(3) Gravel Fill	1	cu.m.	141	141
Sub-Total of A-2				1,071
Sub-Total of A				**1,456**
B. Concrete Work				
1. Materials				
Slab on wood planks				
(1) 16 - 2" x 8" x 6' Coco Lumber	128	bd.ft.	8	1,024
(2) 10mm dia x 6.0m Rebar	3	pcs.	49	147
(3) #16 Tie Wire	0.5	kg.	49	25
(4) Cement	10	bags	117	1,170
(5) Sand	1.5	cu.m.	304	456
(6) Gravel	2	cu.m.	385	770
(7) Stone Lining with Mortar		L.S.	1,014	1,014
Sub-Total of B-1				4,606
2. Labor (25% of B-1)		L.S.		1,152
Sub-Total of B				**5,758**
C. Walls & Posts				
1. Materials				
(1) 4 - 4" x 4" x 10' Coco Lumber	53.33	bd.ft.	8	427
(2) 6 - 2" x 3" x 10' Coco Lumber	30	bd.ft.	8	240
(3) 8 - 2" x 3" x 8' Coco Lumber	32	bd.ft.	8	256
(4) 2.0 m x 5.0 m Sawali	2	rolls	357	714
(5) Assorted Nails	6	kgs.	29	174
(6) Bamboo Clips		L.S.	119	119
Sub-Total of C-1				1,930
2. Labor (25% of C-1)		L.S.		483
Sub-Total of C				**2,413**
D. Roofing Work				
1. Materials				
Rafters				
(1) 4 - 2" x 4" x 6' Coco Lumber	16	bd.ft.	8	128
(2) Bamboo Purlins		L.S.	119	119
(3) Nipa Roofing	2	100	238	476
Sub-Total of D-1		pcs./bandle		723
2. Labor (25% of D-1)		L.S.		181
Sub-Total of D				**904**
E. Plumbing				
1. Material				
(1) Toilet Bowl-Squat Type	1	pc.	547	547
(1) 75mm dia x 6.0m PVC Pipe	1	pc.	129	129
Sub-Total of E-1				676
2. Labor (25% of E-1)		L.S.		169
Sub-Total of E				**845**
F. Freight Cost (9% of Materials for B - E excluding indigenous materials)		**L.S.**		**197**
G. Indirect Cost				
Profit (10% of A - F)		L.S.		1,157
VAT (14% of Profit & Labor)		L.S.		590
Sub-Total of G				**1,747**
Total Construction Cost (A+B+C+D+E+F+G)			**Say**	**13,320 13,300**

Note: L.S. - Lump Sum

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level.

Table 10.2.13 Unit Cost of Ventilated Improved Pit Latrine (VIP)

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Earthwork				
1. Materials				
(1) Gravel Fill	0.5	cu.m	385	193
Sub-Total of A-1				193
2. Labor				
(1) Excavation	3	cu.m	119	357
(2) Backfill	1	cu.m	108	108
(3) Gravel Fill	0.5	cu.m	141	71
Sub-Total of A-2				536
Sub-Total of A				**729**
B. Concrete Work				
1. Materials				
Slab on wood planks				
(1) 8 - 2" x 8" x 6' Coco Lumber	64	bd.ft.	8	512
(2) 10mm dia x 6.0m Rebar	2	pcs.	49	98
(3) #16 Tie Wire	0.5	kg.	49	25
(4) Cement	4	bags	117	468
(5) Sand	0.5	cu.m	304	152
(6) Gravel	0.5	cu.m	385	193
(7) Stone Lining with Mortar		L.S.	1,014	1,014
Sub-total of B-1				2,462
2. Labor (25% of B-1)		L.S.		616
Sub-Total of B				**3,078**
C. Walls & Posts				
1. Materials				
(1) 4 - 4" x 4" x 10' Coco Lumber	53.33	bd.ft.	8	427
(2) 6 - 2" x 3" x 10' Coco Lumber	30	bd.ft.	8	240
(3) 8 - 2" x 3" x 8' Coco Lumber	32	bd.ft.	8	256
(4) 2.0 m x 5.0 m Sawali	2	rolls	357	714
(5) Assorted Nails	6	kgs.	29	174
(6) Bamboo Clips		L.S.	119	119
Sub-Total of C-1				1,930
2. Labor (25% of C-1)		L.S.		483
Sub-Total of C				**2,413**
D. Roofing Work				
1. Materials				
Rafters				
(1) 4 - 2" x 4" x 6' Coco Lumber	16	bd.ft.	8	128
(2) Bamboo Purlins		L.S.	119	119
(3) Nipa Roofing	2	100	238	476
Sub-Total of D-1		pcs./bundle		723
2. Labor (25% of D-1)		L.S.		181
Sub-Total of D				**904**
E. Plumbing				
1. Materials				
(1) 50mm dia PVC Pipe	1	pc.	65	65
(2) Fly Screen		L.S.	50	50
Sub-Total of E-1				115
2. Labor (25% of E-1)		L.S.		29
Sub-Total of E				**144**
F. Freight Cost (9% of Materials for B-E excluding sand and gravel)		**L.S.**		**79**
G. Indirect Cost				
Profit (10% of A - F)		L.S.		735
VAT (14% of Profit & Labor)		L.S.		286
Sub-Total of G				**1,021**
Total of Construction Cost (A+B+C+D+E+F+G)			**Say**	**8,368** **8,400**

Note: L.S. - Lump Sum

Source: DOH standard price in 1993.

Unit Cost: Adjusted to 1995 Price Level

Table 10.2.14 Unit Cost of School Toilet

Sheet-1

(Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization and Demobilization		**L.S.**		**5,300**
B. Earthwork				
1. Materials				
(1) Gravel Fill	3.00	cu.m	385	1,155
Sub-Total of B-1				1,155
2. Labor				
(1) Excavation	15.88	cu.m	119	1,890
(2) Backfill	4.97	cu.m	108	537
(3) Gravel Fill	3.00	cu.m	141	423
Sub-Total of B-2				2,850
Sub-Total of B				**4,005**
C. Concrete Work				
1. Materials				
(1) Cement	61.00	bags	117	7,137
(2) Sand	4.00	cu.m	304	1,216
(3) Gravel	8.00	cu.m	385	3,080
(4) Rebars: 12mm dia x 6m	38.00	pcs.	68	2,584
10mm dia x 6m	57.00	pcs.	49	2,793
(5) #16 Tie Wire	8.00	kgs.	49	392
(6) Formworks:				
1/4" Plywood	6.00	pcs.	405	2,430
2"x2"x10" (Coco Lumber)	200.00	bd.ft.	8	1,600
Sub-Total of C-1				21,232
2. Labor (30% of C-1)		L.S.		6,370
Sub-Total of C				**27,602**
D. Masonry Work				
1. Materials				
(1) 6" CHB	800.00	pcs.	6	4,800
(2) 4" CHB	260.00	pcs.	5	1,300
(3) Cement	97.00	bags	117	11,349
(5) Sand	10.00	cu.m	304	3,040
(6) Rebars: 12mm dia x 6m	30.00	pcs.	68	2,040
10mm dia x 6m	11.00	pcs.	49	539
(7) #16 Tie Wire	4.00	kgs.	49	196
(8) Scaffolding:				
2"x4"x8" = 10 pcs. (Coco Lumber)	53.33	bf.	8	427
Sub-Total of D-1				23,691
2. Labor (30% of D-1)		L.S.		7,107
Sub-Total of D				**30,798**
E. Roofing Work				
1. Materials				
(1) GA #26 Corr. GI (l = 10')	20.00	pcs.	274	5,480
(2) GA #24 Pln. GI Flashing	3.00	pcs.	264	792
(3) GA #24 Pln. GI Gutter (Pre-Fab)	9.00	pcs.	264	2,376
(4) Umbrella Nails 2 - 1/2"	12.00	kgs.	44	528
(5) Rafter - 2"x5"x18' = 5 pcs.	75.00	bf.	32	2,400
(6) Purlins - 2"x2"x12' = 18 pcs.	72.00	bf.	32	2,304
(7) WD Cleats - 2"x2"x10" = 6 pcs.	20.00	bf.	32	640

Table 10.2.14 Unit Cost of School Toilet

Sheet-2 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(8) Nailers - 2"x2"x1012' = 30 pcs.	120.00	bf.	32	3,840
- 2"x2"x10' = 36 pcs.	120.00	bf.	32	3,840
(9) Fascia Board				
1"x12"x12' = 4 pcs.	48.00	bf.	32	1,536
1"x12"x18' = 2 pcs.	36.00	bf.	32	1,152
(10) Wood Plate				
2"x4"x20' = 2 pcs.	26.66	bf.	32	853
(11) 1/4" Thk. Mar. Plywood 4'x8'	14.00	pcs.	29	406
(12) C.W.N. Assorted	15.00	kgs.	29	435
(13) 3" dia x 3m Downspout (PVC)	3.00	pcs.	81	242
(14) 3" dia Elbow (PVC)	2.00	pcs.	15	30
(15) 3"dia Coupling (PVC)	1.00	pcs.	14	14
(16) Ceiling Vent				
1"x1"x8' = 4 pcs.	2.67	bf.	26	69
(17) Screen (1/8"x1/8")	1.00	yd.	81	81
Sub-Total of E-1				27,018
2. Labor (30% of E-1)		L.S.		8,105
Sub-Total of E				**35,123**
F. Carpentry Work				
1. Materials				
(1) D - 1 Hollow Core Tanguile				
Flush Type Door w/ Louver (.80x2.20)	2.00	sets	1,428	2,856
(2) D - 2 Hollow Core Tanguile				
Flush Type Door (.60x2.10)	1.00	sets	1,071	1,071
(3) D - 3 Louver Door (.60x1.40)	5.00	sets	893	4,465
(4) Door Jambs (Apitong)				
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 2 pcs.	20.00	bf.	32	640
2"x6"x10" = 1 pc.	18.00	bf.	32	576
2"x4"x12" = 5 pcs.	40.00	bf.	32	1,280
(7) Wooden Jalousie Window				
With 5 Blades (.40x.50)	14.00	set	298	4,172
(8) Window Jambs (Apitong)				
2"x6"x16" = 5 pcs.	80.00	bf.	32	2,560
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 1 pc.	10.00	bf.	32	320
(9) Cabinet				
3/4"x4'x8' = 1 pc. (plyboard)	1.00	pc.	774	774
Sub-Total of F-1				19,610
2. Labor (30% of F-1)		L.S.		5,883
Sub-Total of F				**25,493**
G. Tile Work				
1. Materials				
(1) 4 - 1/4"x4 - 1/4" Glazed Tiles	1,950.00	pcs.	4	7,800
(2) 0.10x0.20m Floor Tiles	900.00	pcs.	7	6,300
(3) Cement	4.00	bags	117	468
(4) White Cement	1.00	bag	629	629
Sub-Total of G-1				15,197

Table 10.2.14 Unit Cost of School Toilet

Sheet-3 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
2. Labor (30% of G-1)		L.S.		4,559
Sub-Total of G				**19,756**
H. Plumbing Work				
1. Materials				
(1) Toilet Bowl - Squat Type	3.00	sets	596	1,788
(2) Toilet Bowl-Sit Type	2.00	sets	596	1,192
(3) Lavatory	2.00	sets	845	1,690
(4) 4" dia x 3m PVC San. Pipe	4.00	pcs.	149	596
(5) 3" dia x 3m PVC San. Pipe	7.00	pcs.	84	588
(6) 1 1/ 2" dia x 3m PVC San. Pipe	4.00	pcs.	53	212
(7) 2" dia. x 3m PVC San. Pipe	2.00	pcs.	50	100
(8) 6" x 4" Floor Drain	5.00	pcs.	84	420
(9) 2" dia. Elbow PVC	4.00	pcs.	7	28
(10) 4" dia WYB PVC	2.00	pcs.	25	50
(11) 4" dia. x 3" dia. WYB PVC	12.00	pcs.	30	360
(12) 4" dia. x 2" dia. TEE PVC	2.00	pcs.	31	62
(13) 4" dia. TEE PVC	3.00	pcs.	31	93
(14) 1 1/2" dia. WYB PVC	1.00	pcs.	12	12
(15) 4" dia. Clean Out PVC	3.00	pcs.	35	105
(16) 3" dia. Clean Out PVC	1.00	pcs.	28	28
(17) Faucet	3.00	pcs.	50	150
(18) 3" dia. x 2" dia. WYB PVC	2.00	pcs.	25	50
(19) 1 1/2" dia. Elbow PVC	6.00	pcs.	13	78
(20) PVC Cement	1.00	can	121	121
(21) 2" dia. PVC San. Pipe x 3m	2.00	pcs.	79	158
(22) 4" dia. x 2" dia. TEE	2.00	pcs.	21	42
(23) Check Valve 1 1/2"	1.00	pcs.	182	182
(24) 4" P-Trap	5.00	pcs.	66	330
Sub-Total of H-1				8,435
2. Labor (30% of H-1)		L.S.		2,531
Sub-Total of H				**10,966**
I. Painting				
1. Materials				
(1) Acrylic, Semi Gloss	8.00	gals.	261	2,088
(2) Concrete Sealer	4.00	gals.	206	824
(3) Acri Color: Wood	4.00	gals.	80	320
(4) Enamel, QDE	6.00	gals.	266	1,596
(5) Wood Putty	1.00	gals.	302	302
(6) Paint Thinner	1.00	gals.	60	60
(7) Tinting Color	4.00	pint	40	160
(8) Sand Paper (Assorted)	15.00	pcs.	7	105
(9) Misecellaneous		L.S.	1,000	0
(10) Roof Paint (green, ready-mix)	2.00	gals.	281	562
Sub-Total of I-1				6,017
2. Labor (30% of I-1)		L.S.		1,805
Sub-Total of I				**7,822**

Table 10.2.14 Unit Cost of School Toilet

Sheet-4 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
J. Electrical Work				
1. Materials				
(1) 40 Watts Flourescent Lamp	2.00	sets	255	510
(2) Elect. Wire TW #12	24.00	M	7	168
(3) Elect. Conduit - 1/2" dia x 10"	4.00	pcs.	78	312
(4) Entrance Cap. 1/2" dia	1.00	pc.	29	29
(5) Switch Outlet, Flush Type	2.00	pcs.	39	78
(6) Utility Box 2"x3"	2.00	pcs.	7	14
(7) Porcelain Receptacle 2" dia	2.00	pcs.	7	14
(8) Safety Switch 60A, 250V	1.00	set	490	490
(9) Electrical Tape	1.00	roll	22	22
Sub-Total of J-1				1,637
2. Labor (30% of J-1)		L.S.		491
Sub-Total of J				**2,128**
K. Hardware				
1. Materials				
(1) 3"x3" Butt Hinges (Loose Pin)	10.00	pcs.	15	150
(2) 4"x4" Butt Hinges (Loose Pin)	12.00	pcs.	18	216
(3) Door Lockset (Schlage US)	3.00	pcs.	454	1,362
(4) Barrel Bolt (4")	5.00	pcs.	40	200
(5) Cabinet Pull (4")	5.00	pcs.	7	35
(6) Water Storage Cover				
Checkered Plate 1/4" thick				
1.44x0.645 w/ L bar & flat bar	1.00	set	984	984
0.645x0.633 w/ L bar & flat bar	2.00	set	555	1,110
(7) Padlock	1.00	pcs.	378	378
Sub-Total of K-1				4,435
2. Labor (30% of K-1)		L.S.		1,331
Sub-Total of K				**5,766**
L. Septic Tank and Sewage Basin				
1. Materials				
(1) 4" CHB	180.00	pcs.	5	900
(2) Cement	18.00	bags	117	2,106
(3) Sand	1.50	cu.m	304	456
(4) Gravel	1.00	cu.m	385	385
(5) Rebars: 10mm dia x 6m	29.00	pcs.	68	1,972
(6) #16 Tire Wire	2.00	kgs.	49	98
(7) Formworks: Coco Lumber				
2"x3"x10' = 12 pcs.	60.00	bf.	8	480
1/4" plywood ord. 4'x8'	2.00	pcs.	405	810
C.W.N. (Assorted)	2.00	kgs.	29	58
Sub-Total of L-1				7,265
2. Labor (30% of L-1)		L.S.		2,180
Sub-Total of L				**9,445**

Table 10.2.14 Unit Cost of School Toilet

Sheet-5 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
M. Shallow Well (18 depth)				
a. Drilling of Well & Installation of Steel Casing/Screen				
1. Materials				
(1) 63mm x 6m PVC Pipe with socket	2.00	pcs.	813	1,626
(2) 63mm x 3m PVC Pipe with plug	1.00	pc.	410	410
(3) 63mm PVC Socket	1.00	pc.	90	90
(4) 63mm x 3m PVC Screen	1.00	pc.	1,300	1,300
Sub-Total of M-a-1				3,426
2. Labor, Fuel, Lubricant and others				
Well Drilling for 18m depth at 150mm borehole	18.00	m	520	9,360
Sub-Total of M-a				12,786
b. Well Development		L.S.		**500**
c. Gravel Packing, Installation of Hand-Pump and Construction of Platform				
1. Materials				
(1) 50mm Jetmatic Handpump	1.00	set	2,380	2,380
(2) 50mm x 1m GI Pipe (Sch. 40)	1.00	pc.	75	75
(3) #10 Sieved Gravel	0.10	cu.m	870	87
(4) Coarse Sand	0.07	cu.m	430	30
(5) Cement for Sanitary Seal	1.00	bag	117	117
(6) Pump Base and Platform				
1) Cement	4.00	bags	117	468
2) Gravel	1.00	cu.m	385	385
3) Sand	1.00	cu.m	304	304
4) Plywood (1,200mm x 2,400mm x 6mm)	1.00	pc.	405	405
5) Form Lumber (50mmx75mmx1,800mm)	1.00	pc.	45	45
6) Nail	1.00	kg.	29	29
Sub-Total of M-c-1				33,823
2. Labor (40% of M-c-1)		L.S.		13,529
Sub-Total of M-c				47,352
Sub-Total of M				**60,638**
N. Freight Cost (9% of Materials for A - M excluding sand and gravel)		**L.S.**		**14,652**
O. Indirect Cost				
Profit (10% of A - N)		L.S.		25,949
VAT (14% of Profit & Labor)		L.S.		11,577
Sub-Total of O				**37,526**
Total of Construction Cost (A to O)				**297,020**
P. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		2,000
2. Construction Supervision		L.S.		1,500
Sub-Total of P				**3,500**
GRAND TOTAL				**300,520**
			Say	**300,500**

Source: DOH standard price in 1993.
Unit Cost: Adjusted to 1995 Price Level.

Table 10.2.15 Unit Cost of Public Toilet

Sheet-1 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
A. Mobilization and Demobilization (2.4% of B - M)		**L.S.**		6,400
B. Earthwork				
1. Materials				
(1) Gravel Fill	3.00	cu.m	385	1,155
Sub-Total of B-1				1,155
2. Labor				
(1) Excavation	15.88	cu.m	119	1,890
(2) Backfill	4.97	cu.m	108	537
(3) Gravel Fill	3.00	cu.m	141	423
Sub-Total of B-2				2,850
Sub-Total of B				**4,005**
C. Concrete Work				
1. Materials				
(1) Cement	61.00	bags	117	7,137
(2) Sand	4.00	cu.m	304	1,216
(3) Gravel	8.00	cu.m	385	3,080
(4) Rebars: 12mm dia x 6m	38.00	pcs.	68	2,584
10mm dia x 6m	57.00	pcs.	48	2,736
(5) #16 Tie Wire	8.00	kgs.	48	384
(6) Formworks:				
1/4" Plywood	6.00	pcs.	405	2,430
2"x2"x10" (Coco Lumber)	200.00	bd.ft.	8	1,600
Sub-Total of C-1				21,167
2. Labor (30% of C-1)		L.S.		6,350
Sub-Total of C				**27,517**
D. Masonry Work				
1. Materials				
(1) 6" CHB	800.00	pcs.	6	4,800
(2) 4" CHB	260.00	pcs.	5	1,300
(3) Cement	97.00	bags	117	11,349
(5) Sand	10.00	cu.m	304	3,040
(6) Rebars: 12mm dia x 6m	30.00	pcs.	68	2,040
10mm dia x 6m	11.00	pcs.	49	539
(7) #16 Tie Wire	4.00	kgs.	49	196
(8) Scaffolding:				
2"x4"x8" = 10 pcs. (Coco Lumber)	53.33	bf.	8	427
Sub-Total of D-1				23,691
2. Labor (30% of D-1)		L.S.		7,107
Sub-Total of D				**30,798**
E. Roofing Work				
1. Materials				
(1) GA #26 Corr. GI (1 = 10')	20.00	pcs.	274	5,480
(2) GA #24 Pln. GI Flashing	3.00	pcs.	264	792
(3) GA #24 Pln. GI Gutter (Pre-Fab)	9.00	pcs.	264	2,376
(4) Umbrella Nails 2 - 1/2"	12.00	kgs.	44	528
(5) Rafter - 2"x5"x18' = 5 pcs.	75.00	bf.	32	2,400

Table 10.2.15 Unit Cost of Public Toilet

Sheet-2 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(6) Purlins - 2"x2"x12' = 18 pcs.	72.00	bf.	32	2,304
(7) WD Cleats - 2"x2"x10" = 6 pcs.	20.00	bf.	32	640
(8) Nailers - 2"x2"x1012' = 30 pcs.	120.00	bf.	32	3,840
- 2"x2"x10' = 36 pcs.	120.00	bf.	32	3,840
(9) Fascia Board				
1"x12"x12' = 4 pcs.	48.00	bf.	32	1,536
1"x12"x18' = 2 pcs.	36.00	bf.	32	1,152
(10) Wood Plate				
2"x4"x20' = 2 pcs.	26.66	bf.	32	853
(11) 1/4" Thk. Mar. Plywood 4'x8'	14.00	pcs.	452	6,328
(12) C.W.N. Assorted	15.00	kgs.	29	435
(13) 3" dia x 3m Downspout (PVC)	3.00	pcs.	81	243
(14) 3" dia Elbow (PVC)	2.00	pcs.	15	30
(15) 3"dia Coupling (PVC)	1.00	pcs.	14	14
(16) Ceiling Vent, 1"x1"x8', 4 pcs.	2.67	bf.	26	69
(17) Screen (1/8"x1/8")	1.00	yd.	81	81
Sub-Total of E-1				32,941
2. Labor (30% of E-1)		L.S.		9,882
Sub-Total of E				**42,823**
F. Carpentry Work				
1. Materials				
(1) D - 1 Hollow Core Tanguile				
Flush Type Door w/ Louver (.80x2.20)	2.00	sets	1,428	2,856
(2) D - 2 Hollow Core Tanguile				
Flush Type Door (.60x2.10)	1.00	sets	1,071	1,071
(3) D - 3 Louver Door (.60x1.40)	5.00	sets	893	4,465
(4) Door Jambs (Apitong)				
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 2 pcs.	20.00	bf.	32	640
2"x6"x10" = 1 pc.	18.00	bf.	32	576
2"x4"x12" = 5 pcs.	40.00	bf.	32	1,280
(7) Wooden Jalousie Window				
With 5 Blades (.40x.50)	14.00	set	298	4,172
(8) Window Jambs (Apitong)				
2"x6"x16" = 5 pcs.	80.00	bf.	32	2,560
2"x6"x14" = 1 pc.	14.00	bf.	32	448
2"x6"x10" = 1 pc.	10.00	bf.	32	320
(9) Cabinet				
3/4"x4'x8' = 1 pc. (plyboard)	1.00	pc.	774	774
Sub-Total of F-1				19,610
2. Labor (30% of F-1)		L.S.		5,883
Sub-Total of F				**25,493**
G. Tile Work				
1. Materials				
(1) 4 - 1/4"x4 - 1/4" Glazed Tiles	1,950.00	pcs.	4	7,800
(2) 0.10x0.20m Floor Tiles	900.00	pcs.	7	6,300
(3) Cement	4.00	bags	117	468

Table 10.2.15 Unit Cost of Public Toilet

Sheet-3 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(4) White Cement	1.00	bag	629	629
(5) Tiles Fittings		L.S.	4,790	4,790
Sub-Total of G-1				19,987
2. Labor (30% of G-1)		L.S.		5,996
Sub-Total of G				**25,983**
II. Plumbing Work				
1. Materials				
(1) Urinal	3.00	sets	1,063	3,189
(2) Toilet Bowl - Squat Type	6.00	sets	596	3,576
(3) 4" dia x 3m PVC San. Pipe	6.00	pcs.	149	894
(4) 3" dia x 3m PVC San. Pipe	4.00	pcs.	84	336
(5) 2" dia x 3m PVC San. Pipe	3.00	pcs.	50	150
(6) 3/4" dia x 6m G.I. Pipe Sch. 40	5.00	pcs.	244	1,220
(7) 1/2" dia x 6m G.I. Pipe Sch. 40	1.00	pcs.	179	179
(8) 4"x4" WYE PVC	1.00	pcs.	25	25
(9) 3" dia Elbow PVC	10.00	pcs.	30	300
(10) 3" dia 45 degrees Bend PVC	2.00	pcs.	25	50
(11) 2" dia Elbow PVC	6.00	pcs.	7	42
(12) 2" dia 45 degrees Bend PVC	2.00	pcs.	20	40
(13) 1/2" dia Elbow G.I.	5.00	pcs.	10	50
(14) 4" dia 3" dia WYE PVC	8.00	pcs.	40	320
(15) 3/4" dia TEE G.I.	7.00	pcs.	40	280
(16) 1/2" dia TEE G.I.	5.00	pcs.	20	100
(17) 4" dia x 2" dia TEE PVC	6.00	pcs.	40	240
(18) 4" dia Clean Out PVC	3.00	pcs.	35	105
(19) 2" dia Clean Out PVC	1.00	pcs.	25	25
(20) Faucet	10.00	pcs.	50	500
(21) 3" dia x 2" dia Elbow Reducer PVC	1.00	pcs.	28	28
(22) 3" dia x 2" dia WYE PVC	3.00	pcs.	25	75
(23) 2" dia x 2" dia WYE PVC	3.00	pcs.	15	45
(24) PVC Cement	1.00	can	121	121
(25) 4" dia x 2" dia WYE PVC	2.00	pcs.	40	80
(26) Gate Valve 3/4" dia	1.00	pcs.	121	121
(27) Gate Valve 1/2" dia	1.00	pcs.	96	96
(28) Water Meter 3/4" dia	1.00	pcs.	1,261	1,261
(29) 3/4"dia x1/2"dia Elbow Reducer G.I.	1.00	pcs.	14	14
Sub-Total of H-1				13,462
2. Labor (30% of H-1)		L.S.		4,039
Sub-Total of H				**17,501**
I. Painting				
1. Materials				
(1) Acrylic, Semi Gloss	8.00	gals.	261	2,088
(2) Concrete Sealer	4.00	gals.	206	824
(3) Acri Color: Wood	4.00	gals.	80	320
(4) Enamel, QDE	6.00	gals.	266	1,596
(5) Wood Putty	1.00	gals.	302	302
(6) Paint Thinner	1.00	gals.	60	60

Table 10.2.15 Unit Cost of Public Toilet

Sheet-4 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(7) Tinting Color	4.00	pint	40	160
(8) Sand Paper (Assorted)	15.00	pcs.	7	105
(9) Misecellaneous		L.S.	1,005	0
(10) Roof Paint (green, ready-mix)	2.00	gals.	281	562
Sub-Total of I-1				6,017
2. Labor (30% of I-1)		L.S.		1,805
Sub-Total of I				**7,822**
J. Electrical Work				
1. Materials				
(1) 40 Watts Flourescent Lamp	2.00	sets	255	510
(2) Elect. Wire TW #12	24.00	M	7	168
(3) Elect. Conduit - 1/2" dia x 10"	4.00	pcs.	78	312
(4) Entrance Cap. 1/2" dia	1.00	pc.	29	29
(5) Switch Outlet, Flush Type	2.00	pcs.	39	78
(6) Utility Box 2"x3"	2.00	pcs.	7	14
(7) Porcelain Receptacle 2" dia	2.00	pcs.	7	14
(8) Safety Switch 60A, 250V	1.00	set	490	490
(9) Electrical Tape	1.00	roll	22	22
Sub-Total of J-1				1,637
2. Labor (30% of J-1)		L.S.		491
Sub-Total of J				**2,128**
K. Hardware				
1. Materials				
(1) 3"x3" Butt Hinges (Loose Pin)	10.00	pcs.	15	150
(2) 4"x4" Butt Hinges (Loose Pin)	12.00	pcs.	18	216
(3) Door Lockset (Schlage US)	3.00	pcs.	454	1,362
(4) Barrel Bolt (4")	5.00	pcs.	40	200
(5) Cabinet Pull (4")	5.00	pcs.	7	35
(6) Water Storage Cover				
Checkered Plate 1/4" thick				
1.44x0.633 w/ L bar & flat bar	1.00	set	984	984
(7) 0.645x0.633 w/ L bar & flat bar	2.00	set	555	1,110
(8) Padlock	1.00	pcs.	378	378
Sub-Total of K-1				4,435
2. Labor (30% of K-1)		L.S.		1,331
Sub-Total of K				**5,766**
L. Septic Tank and Sewage Basin				
1. Materials				
(1) 4" CHB	180.00	pcs.	5	900
(2) Cement	18.00	bags	117	2,106
(3) Sand	1.50	cu.m	304	456
(4) Gravel	1.00	cu.m	385	385
(5) Rebars: 10mm dia x 6m	29.00	pcs.	68	1,972
(6) #16 Tire Wire	2.00	kgs.	49	98

Table 10.2.15 Unit Cost of Public Toilet

Sheet-5 (Cost: Peso)

Description	Quantity	Unit	Unit Cost	Cost
(7) Formworks: Coco Lumber				
2"x3"x10' = 12 pcs.	60.00	bf.	8	480
1/4" plywood ord. 4'x8'	2.00	pcs.	405	810
C.W.N. (Assorted)	2.00	kgs.	29	58
Sub-Total of L-1				7,265
2. Labor (30% of L-1)		L.S.		2,180
Sub-Total of L				**9,445**
M. Concrete Water Tank (Elevated)				
1. Earth Work				
(1) Materials				
1) Gravel Fill	1.00	cu.m	385	385
Sub-Total of M-1 (1)				385
(2) Labor				
1) Excavation	14.70	cu.m	119	1,749
2) Backfill	13.08	cu.m	108	1,413
3) Gravel Fill	1.00	cu.m	141	141
Sub-Total of M-1 (2)				3,303
Sub-Total of M-1				3,688
2. Materials				
(1) Cement	62.00	bags	117	7,254
(2) Sand	4.50	cu.m	304	1,368
(3) Gravel	8.00	cu.m	385	3,080
(4) Rebars: 12mm dia x 6m	160.00	pcs.	49	7,840
(5) #16 Tie Wire	4.00	kgs.	49	196
(6) Formworks:				
1/4" plywood	12.00	pcs.	405	4,860
2"x3"x16' = 60 pcs.	480.00	bf.	8	3,840
(7) C.W.N. (Assorted)	5.00	kgs.	29	145
Sub-Total of M-2				39,647
3. Labor (30% of M-2)		L.S.		11,894
Sub-Total of M				**55,229**
N. Freight Cost (9% of Materials for A - M excluding sand and gravel)		**L.S.**		**15,951**
O. Indirect Cost				
Profit (10% of A - M)		L.S.		27,686
VAT (14% of Profit & Labor)		L.S.		12,712
Sub-Total of O				**40,398**
Total of Construction Cost (A to O)				**317,259**
P. Estimated Government Expenses				
1. Preliminary & Detailed Engineering Cost		L.S.		2,000
2. Construction Supervision		L.S.		1,500
Sub-Total of P				**3,500**
GRAND TOTAL				**320,759**
			Say	**320,800**

Source: DOH standard price in 1993.
Unit Cost: Adjusted to 1995 Price level.

10.2.2 Unit Cost of Equipment

Unit cost (CIF Manila) of equipment was referred to the standard cost estimates of DPWH as follows.

(1) Medium size rotary drilling rig

Type:

Truck-mounted top head drive mud circulation type

Rated drilling capacity:

150 m depth for ϕ250 mm bore hole

Equipment composition:

One unit of truck-mounted drilling rig

Each one set of operating accessories, drilling tools, casing tools and fishing tools

One set of spare parts (equivalent to 10% of above equipment/tool cost)

Unit cost:

Peso 17,370,000 per set

(2) Medium size percussion drilling equipment

Type:

Truck-mounted cable percussion type

Rated drilling capacity:

150 m depth for ϕ250 mm bore hole

Equipment composition:

One unit of truck-mounted drilling rig

Each one set of operating accessories, drilling tools, pipe handling tools and fishing tools

One set of spare parts (equivalent to 10% of above equipment/tool cost)

Unit cost:

Peso 10,280,000 per set

(3) Well rehabilitation equipment

Equipment composition:

One unit of diesel engine driven air compressor (7.5 kg/sq.cm, 500 liter/min.)

One set of air hose and hose fittings

Unit cost:

Peso 138,000 per set

(4) Service truck

Type:

Diesel engine driven 4 tons truck equipped with crane

Unit cost:

Peso 1,175,000 per unit

(5) Support vehicle

Type:

Diesel engine driven pick-up truck with electric winch

Unit cost:

Peso 500,000 per unit

(6) Refuse collection truck

Type:

Closed type compactor truck with 5 cu.m of payload capacity

Unit cost:

Peso 1,380,000 per unit including spare parts

10.3 Cost of Required Facilities and Equipment

10.3.1 Cost of Required Facilities

Table 10.3.1 Construction Cost of Water Supply Facilities Required for Phase I (2000)

Unit: 1,000 Pesos

Municipalities	Urban Water Supply Level III	Rural Water Supply									Grand Total
		New System							Level I Rehabilitation	Total	
		Level II	Level I								
			Deep Well			Shallow Wells	Spring Dev.	Sub-Total			
			30 m	50 m	70 m						
Bangued (Capital)	3,796	0	0	1,581	0	0	0	1,581	31	1,612	5,408
Boliney	352	0	0	0	0	0	957	957	0	957	1,309
Bucay	1,228	0	0	2,283	0	0	0	2,283	45	2,328	3,556
Bucloc	0	0	0	0	0	0	1,436	1,436	0	1,436	1,436
Daguioman	0	0	0	0	0	0	1,196	1,196	0	1,196	1,196
Danglas	364	0	0	176	0	0	0	176	3	179	543
Dolores	364	0	0	0	0	0	0	0	0	0	364
Lacub	1,488	0	0	0	0	0	1,196	1,196	0	1,196	2,684
Lagangilang	1,295	0	0	4,918	0	0	0	4,918	97	5,015	6,310
Lagayan	1,164	0	0	3,513	0	0	0	3,513	69	3,582	4,746
Langiden	92	0	0	0	0	0	0	0	0	0	92
La Paz	1,584	0	0	4,215	0	0	0	4,215	83	4,298	5,882
Licuan	372	0	0	0	0	0	1,436	1,436	0	1,436	1,808
Luba	1,029	0	4,054	0	0	0	0	4,054	117	4,171	5,200
Malibcong	0	0	0	0	0	0	957	957	0	957	957
Manabo	1,624	0	238	0	0	0	0	238	7	245	1,869
Penarrubia	144	0	0	351	0	0	0	351	7	358	502
Pidigan	540	0	0	703	0	0	0	703	14	717	1,257
Pilar	688	0	2,385	0	0	0	0	2,385	69	2,454	3,142
Sallapadan	3,264	0	1,550	0	0	0	0	1,550	45	1,595	4,859
San Isidro	188	0	477	0	0	0	0	477	14	491	679
San Juan	1,140	0	0	4,215	0	0	0	4,215	83	4,298	5,438
San Quintin	2,020	0	0	2,810	0	0	0	2,810	55	2,865	4,885
Tayum	720	0	0	2,108	0	0	0	2,108	41	2,149	2,869
Tineg	0	0	0	0	0	0	2,632	2,632	0	2,632	2,632
Tubo	0	1,100	0	0	0	0	1,077	1,077	0	2,177	2,177
Villaviciosa	244	0	358	0	0	0	0	358	10	368	612
Provincial Total	23,700	1,100	9,062	26,873	0	0	10,887	46,822	790	48,712	72,412

Table 10.3.2 Construction Cost of Water Supply Facilities Required for Phase II (2010)

Unit: 1,000 Pesos

Municipalities	Urban Water Supply Level III	Rural Water Supply (Level I)								Grand Total
		New System						Level I Rehabilitation	Total	
		Deep Well			Shallow Wells	Spring Dev.	Sub-total			
		30 m	50 m	70 m						
Bangued (Capital)	16,617	0	7,728	0	0	0	7,728	152	7,880	24,497
Boliney	437	0	0	0	0	837	837	0	837	1,274
Bucay	10,530	0	3,688	0	0	0	3,688	72	3,760	14,290
Bucloc	0	0	0	0	0	479	479	0	479	479
Daguioman	0	0	0	0	0	359	359	0	359	359
Danglas	6,253	0	703	0	0	0	703	14	717	6,970
Dolores	2,949	0	2,283	0	0	0	2,283	45	2,328	5,277
Lacub	1,465	0	0	0	0	359	359	0	359	1,824
Lagangilang	5,465	0	3,162	0	0	0	3,162	62	3,224	8,689
Lagayan	2,538	0	878	0	0	0	878	17	895	3,433
Langiden	1,399	0	878	0	0	0	878	17	895	2,294
La Paz	12,776	0	3,337	0	0	0	3,337	66	3,403	16,179
Lacuan	966	0	0	0	0	718	718	0	718	1,684
Luba	899	1,073	0	0	0	0	1,073	31	1,104	2,003
Malibcong	0	0	0	0	0	837	837	0	837	837
Manabo	15,307	1,073	0	0	0	0	1,073	31	1,104	16,411
Penarrubia	1,232	0	1,405	0	0	0	1,405	28	1,433	2,665
Pidigan	10,752	0	2,459	0	0	0	2,459	48	2,507	13,259
Pilar	1,184	1,789	0	0	0	0	1,789	52	1,841	3,025
Sal-lapadan	3,012	835	0	0	0	0	835	24	859	3,871
San Isidro	2,165	835	0	0	0	0	835	24	859	3,024
San Juan	4,577	0	2,810	0	0	0	2,810	55	2,865	7,442
San Quintin	1,262	0	1,405	0	0	0	1,405	28	1,433	2,695
Tayum	3,393	0	3,162	0	0	0	3,162	62	3,224	6,617
Tineg	0	0	0	0	0	718	718	0	718	718
Tubo	0	0	0	0	0	1,196	1,196	0	1,196	1,196
Villaviciosa	3,115	954	0	0	0	0	954	28	982	4,097
Provincial Total	108,293	6,559	33,898	0	0	5,503	45,960	856	46,816	155,109

Table 10.3.3 Costs of Sanitation Facilities Required for Phase I (2000)

Unit: 1,000 Pesos

Municipality	Urban Sanitation									Rural Sanitation							
	Household Toilets					Public School Toilets	Public Toilets	Total Construction Cost	Total Public Investment Cost	Household Toilets					Public School Toilets	Total Construction Cost	Total Public Investment Cost
	Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost					Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost			
Bangued (Capital)	631	0	0	631	0	1,583	0	2,214	1,583	12,391	35,804	1,420	49,615	1,473	2,383	51,998	3,856
Boliney	779	971	0	1,750	40	0	0	1,750	40	1,855	4,602	218	6,675	189	0	6,675	189
Bucay	1,521	2,234	0	3,755	92	446	0	4,201	538	1,929	10,547	428	12,904	434	2,242	15,146	2,676
Bucloc	0	0	0	0	0	0	0	0	0	0	2,514	0	2,514	103	0	2,514	103
Daguioman	0	0	0	0	0	0	0	0	0	0	1,862	0	1,862	77	0	1,862	77
Danglas	519	266	0	785	11	0	317	1,102	328	779	1,663	0	2,442	68	0	2,442	68
Dolores	2,115	239	0	2,354	10	0	0	2,354	10	519	5,107	386	6,012	210	0	6,012	210
Lacub	816	0	0	816	0	0	0	816	0	0	333	109	442	14	0	442	14
Lagangilang	1,781	372	0	2,153	15	0	0	2,153	15	2,671	5,573	596	8,840	229	0	8,840	229
Lagayan	1,113	0	0	1,113	0	0	0	1,113	0	0	1,503	0	1,503	62	0	1,503	62
Langiden	0	0	0	0	0	0	0	0	0	0	1,889	151	2,040	78	0	2,040	78
La Paz	2,078	0	0	2,078	0	360	0	2,438	360	0	6,504	344	6,848	268	971	7,819	1,239
Licuan	668	0	0	668	0	0	0	668	0	1,632	186	160	1,978	8	0	1,978	8
Luba	1,299	0	0	1,299	0	0	0	1,299	0	2,523	3,165	0	5,688	130	658	6,346	788
Malibcong	0	0	0	0	0	0	0	0	0	0	3,498	0	3,498	144	777	4,275	921
Manabo	2,560	1,463	0	4,023	60	556	0	4,579	616	0	2,035	269	2,304	84	633	2,937	717
Penarrubia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pidigan	0	0	0	0	0	0	0	0	0	0	399	445	844	16	390	1,234	406
Pilar	1,187	293	0	1,480	12	0	317	1,797	329	4,192	5,240	496	9,928	216	1,149	11,077	1,365
Sal-lapadan	1,744	479	0	2,223	20	0	0	2,223	20	0	652	0	652	27	0	652	27
San Isidro	223	0	0	223	0	0	317	540	317	0	958	218	1,176	39	526	1,702	565
San Juan	1,410	0	0	1,410	0	0	0	1,410	0	0	8,459	521	8,980	348	453	9,433	801
San Quintin	816	306	0	1,122	13	0	317	1,439	330	0	5,626	0	5,626	231	0	5,626	231
Tayum	1,447	0	0	1,447	0	0	0	1,447	0	0	1,210	571	1,781	50	690	2,471	740
Tineg	0	0	0	0	0	0	0	0	0	0	3,378	0	3,378	139	788	4,166	927
Tubo	0	0	0	0	0	0	0	0	0	2,745	5,586	0	8,331	230	823	9,154	1,053
Villaviciosa	0	93	0	93	4	0	317	410	321	0	1,583	269	1,852	65	657	2,509	722
Provincial Total	22,707	6,716	0	29,423	277	2,945	1,585	33,953	4,807	31,236	119,876	6,601	157,713	4,932	13,140	170,853	18,072

Table 10.3.4 Costs of Sanitation Facilities Required for Phase II (2010)

Unit: 1,000 Pesos

Municipality	Urban Sanitation										Rural Sanitation							
	Household Toilets					Public School Toilets	Public Toilets	Total Construction Cost	Total Public Investment Cost	Urban Sewerage	Household Toilets					Public School Toilets	Total Construction Cost	Total Public Investment Cost
	Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost						Flush	Pour Flush	VIP Latrine	Sub-total of Construction Cost	Sub-total of Public Investment Cost			
Bangued (Capital)	53,832	4,070	0	57,902	167	987	317	59,206	1,471	63,561	27,380	28,515	0	55,895	1,173	2,476	58,371	3,649
Bolinoy	2,857	239	0	3,096	10	0	0	3,096	10	0	6,715	3,431	0	10,146	141	0	10,146	141
Bucay	11,761	213	0	11,974	9	0	0	11,974	9	0	779	19,458	0	20,237	800	1,272	21,509	2,072
Bucloc	0	0	0	0	0	0	0	0	0	0	0	3,764	0	3,764	155	0	3,764	155
Daguioman	0	0	0	0	0	0	0	0	0	0	0	2,514	0	2,514	103	0	2,514	103
Danglas	7,197	0	0	7,197	0	0	0	7,197	0	0	1,002	2,354	0	3,356	97	0	3,356	97
Dolores	6,604	346	0	6,950	14	0	317	7,267	331	0	297	12,781	0	13,078	526	402	13,480	928
Lacub	2,449	200	0	2,649	8	0	0	2,649	8	0	0	3,219	0	3,219	132	0	3,219	132
Lagangilang	9,015	678	0	9,693	28	0	317	10,010	345	0	1,150	16,944	0	18,094	697	671	18,765	1,368
Lagayan	3,079	239	0	3,318	10	0	0	3,318	10	0	0	4,309	0	4,309	177	0	4,309	177
Langiden	1,558	0	0	1,558	0	0	317	1,875	317	0	0	3,338	0	3,338	137	0	3,338	137
La Paz	14,172	186	0	14,358	8	0	0	14,358	8	0	0	14,098	0	14,098	580	494	14,592	1,074
Licuan	2,374	200	0	2,574	8	0	317	2,891	325	0	6,789	3,910	0	10,699	161	0	10,699	161
Luba	4,378	466	0	4,844	19	0	0	4,844	19	0	2,931	7,089	0	10,020	292	299	10,319	591
Malibcong	0	0	0	0	0	0	0	0	0	0	0	6,929	0	6,929	285	0	6,929	285
Manabo	17,103	0	0	17,103	0	305	0	17,408	305	0	0	7,209	0	7,209	297	348	7,557	645
Penarrubia	853	1,290	0	2,143	53	0	0	2,143	53	0	2,041	9,190	0	11,231	378	0	11,231	378
Pidigan	11,056	492	0	11,548	20	0	0	11,548	20	0	0	12,409	0	12,409	510	530	12,939	1,040
Pilar	4,786	426	0	5,212	18	0	0	5,212	18	0	4,563	11,172	0	15,735	460	525	16,260	985
Sal-lapadan	5,194	479	0	5,673	20	0	0	5,673	20	0	0	6,770	0	6,770	278	0	6,770	278
San Isidro	2,486	106	0	2,592	4	0	0	2,592	4	0	0	6,211	0	6,211	255	0	6,211	255
San Juan	4,600	146	0	4,746	6	0	0	4,746	6	0	0	12,449	0	12,449	512	530	12,979	1,042
San Quintin	2,634	186	0	2,820	8	0	0	2,820	8	0	0	6,171	0	6,171	254	0	6,171	254
Tayum	8,088	492	0	8,580	20	0	0	8,580	20	0	482	17,104	0	17,586	703	570	18,156	1,273
Tineg	0	0	0	0	0	0	0	0	0	0	0	5,293	0	5,293	218	0	5,293	218
Tubo	0	0	0	0	0	0	0	0	0	0	8,459	5,865	0	14,324	241	461	14,785	702
Villaviciosa	3,487	0	0	3,487	0	0	0	3,487	0	0	0	7,036	0	7,036	289	0	7,036	289
Provincial Total	179,563	10,454	0	190,017	430	1,292	1,585	192,894	3,307	63,561	62,588	239,532	0	302,120	9,851	8,578	310,698	18,429

10.4 Costs of Sector Management

10.4.1 Breakdown of Community Development and Training Cost

Cost of community development and training was estimated at 12% of the total construction cost of Level I & II water supply facilities and public toilets and at 3% of the total construction cost of Level III water supply systems. This was formulated based on the following:

(1) The 12% was derived on the basis of DILG's past experience in BWSA formation; and
(2) The 3% was derived on the basis of LWUA's past experience in the institutional strengthening needs of W.Ds.

These ratios adopted for estimating community development and training cost will allow the province to meet with its needs for community development in the sector management. The following breakdown provides a view of the components under this category.

Table 10.4.1 Breakdown of Community Development and Training Cost

Component	% Share of Cost
1. Preparation for Training Activities	10
1.1 Transportation	1
1.2 Technical Assistance	1
1.3 Food	1
1.4 Supplies and Materials including Production of Training Kits	6
1.5 Generation of Training Aids	1
2. Conduct of Training Activities	53
2.1 Transporation	5
2.2 Food	12
2.3 Accommodation	33
2.4 Training Room Rental	1
2.5 Miscellaneous	2
3. Field Visits to Support BWSA Formation	37
3.1 Transporation	5
3.2 Food	15
3.3 Accommodation	12
3.4 Field	4
Total	100

11. FINANCIAL ARRANGEMENTS

11.3 Additional Funding Requirements

Percentages for Annual Investment

Percentages of annual investment for different fields of implementation activities are assumed for each sub-sector as general indication and summarized in Table 11.3.1. Assumptions on investment timing shall be subject to change, especially for individual projects depending on fund availability and relevant conditions such as land acquisition and institutional set-up.

Table 11.3.1 Percentages for Annual Investment

Sub-Sector	Component	1996	1997	1998	1999	2000	Total
Urban Water Supply	Level III System						
	Feasibility Study and Detail Design	50	50	0	0	0	100
	Construction & Supervision	0	20	30	30	20	100
	Community Development & Training	30	20	20	20	10	100
Rural Water Supply	Level I Facility						
	Detail Design	50	50	0	0	0	100
	Construction & Supervision	12	22	22	22	22	100
	Community Development & Training	22	22	22	22	12	100
	Level II System						
	Detail Design	100	0	0	0	0	100
	Construction & Supervision	50	50	0	0	0	100
	Community Development & Training	50	50	0	0	0	100
Sanitation	Urban Household Toilet	12	22	22	22	22	100
	Rural Household Toilet	12	22	22	22	22	100
	Public School Toilet	12	22	22	22	22	100
	Public Toilet	12	22	22	22	22	100
	Disinfection of Level I Wells	12	22	22	22	22	100
	Detail Design	100	0	0	0	0	100
	Construction & Supervision	12	22	22	22	22	100
	Community Development & Training	22	22	22	22	12	100

Urban water supply:

- Engineering services for feasibility study and detailed design will be undertaken in the first two years.
- Construction work accompanied by supervisory services will be commenced partially in 2nd year and in full operation from 3rd year to 4th year.
- Community development will take place from the first year.

Rural water supply (Level I):

- Engineering services for detailed design will be undertaken during the first two years for Level I and completed within the first year for Level II.
- Construction work accompanied by supervisory services will be partially commenced from the first year and in full operation from 2nd year for Level I, while Level II will be completed within first two years.
- Community development and training will take place from the first year for Level I, while Level II will be completed within the first two years.

Sanitation:

- Engineering services for detailed design will be completed within the first year.
- Construction work accompanied by supervisory services will be partially commenced in the first year and in full operation from 2nd year.
- Community development and training will be in full operation from the first year.

11.4 Medium-Term Implementation Arrangements

11.4.2 Alternative Countermeasures

The Local Government Empowerment Fund (LGEF)

The Local Government Empowerment Fund (LGEF) will be established in 1996. Purposes, concept and mechanics of LGEF are discussed below.

(1) Purpose

1) To provide a mechanism for channeling grants and/or concessional loan funds to LGUs
2) To rationalize the allocation of funds to priority national projects in support of devolved activities of LGUs over and above their mandated IRA shares
3) To effect a more transparent presentation to fund allocations to LGUs in the budget

(2) Concept

1) The LGEF is an umbrella program fund in the GAA (General Appropriate Act) for national government projects being implemented by national government agencies with components supportive of devolved activities of LGUs.

2) Projects under the LGEF are to be supported wholly or partially by grants or highly concessional loans such as those from the ADF funds from ADB, which carry zero interest and payable in 40 years. Highly concessional loan is defined as those loans with a grant element of no less than 75%.
3) Projects for inclusion in the LGEF will be basically those under the economic and health services sectors.
4) As a matter of strategy, to ensure sustainability of LGU support to the project, a "matching fund" of no less than 10% of the total project cost shall be required from the beneficiary LGU. "The matching fund" may be in cash or in-kind.

(3) Mechanics

1) Authorization of funds for the eligible projects will be made under the budgets of the implementing agencies following usual budgetary process, rules and regulations.
2) The LGEF like MDF (Municipal Development Fund) will be included as one of the items under Assistance to Local Government Units (ALGU) authorized in the GAA. It will likewise identity foreign assisted projects being implemented by national government agencies with components that are directly benefiting specific LGUs, such as the implementation of devolved activities. However, unlike the MDF, fund allocations for LGU projects under LGEF are not to be repaid and are to be treated as subsidies.
3) The LGEF will support programs/activities of the 19 priority provinces under the Social Reform Agenda (SRA) and/or those classified as 5th or 6th class LGUs.

Fund from Tobacco Excise Tax under RA7171

Contents of "An Act to promote the development of the farmers in the Virginia tobacco producing provinces" (RA7171) are as follows:

(1) RA7171 was implemented in 1992. Actual allotment started in 1994. Its objective is to advance the self-reliance of the tobacco farmers through the support to the Virginia tobacco-producing provinces.

(2) An amount of 15% of the tobacco excise taxes on locally manufactured Virginia type cigarettes based on actual collection by the Bureau of Internal Revenue for the second calendar year preceding the year of distribution (namely, the collection in 1992 for 1994

distribution) was allotted to 4 Virginia tobacco producing provinces (Abra, Ilocos Norte, Ilocos Sur and La Union).

(3) This allotment is treated as a special account under the general fund of LGUs of the provinces to be utilized for (a) cooperative projects that will enhance better quality of products, (b) livelihood projects particularly the development of alternative farming system, (c) agro-industrial projects and (d) infrastructure projects. (Thus, this allotment can be utilized for development of the water supply and sanitation sector although they are not major targeted projects.)

(4) The allotted amounts to provincial governments and municipalities (unit: 1,000 pesos) in 1994 are shown below.

	Provincial Government	Municipalities (total)
Abra:	12,276	16,367
Ilocos Norte:	16,596	21,647
Ilocos Sur:	47,025*	83,600
La Union:	36,924	49,232

* Based on the Provincial Annual Report in 1994. Other figures are derived from DBM.

Table 11.4.1 Comprehensive Investment Need Ranking of the Municipalities

Municipality	Evaluation Factor (% of Underserved and Unserved Population or Households)				Score by Sub-Sector				Weighted Score by Sub-Sector					Synthetic Investment Need Ranking
	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Total Weighted Score	
Bangued (Capital)	N.A.	8	13	95	0.32	0.20	0.20	1.00	0.08	0.05	0.05	0.25	0.43	16
Boliney	N.A.	24	86	85	0.30	0.40	1.00	0.80	0.08	0.10	0.25	0.20	0.63	7
Bucay	N.A.	14	60	63	0.39	0.20	0.60	0.60	0.10	0.05	0.15	0.15	0.45	15
Bucloc	N.A.	52	100	64	N.A.	0.80	1.00	0.60	N.A.	0.40	0.25	0.15	0.80	2
Daguioman	N.A.	59	100	61	N.A.	0.80	1.00	0.60	N.A.	0.40	0.25	0.15	0.80	2
Danglas	N.A.	8	27	40	0.32	0.20	0.40	0.40	0.08	0.05	0.10	0.10	0.33	23
Dolores	N.A.	3	38	52	0.26	0.20	0.40	0.60	0.07	0.05	0.10	0.15	0.37	18
Lacub	N.A.	53	0	31	1.00	0.80	0.20	0.40	0.25	0.20	0.05	0.10	0.60	8
Lagangilang	N.A.	29	34	51	0.76	0.40	0.40	0.60	0.19	0.10	0.10	0.15	0.54	13
Lagayan	N.A.	67	20	41	0.73	1.00	1.00	0.40	0.18	0.25	0.25	0.10	0.78	4
Langiden	N.A.	4	0	54	0.32	0.20	0.20	0.60	0.08	0.05	0.05	0.15	0.33	25
La Paz	N.A.	25	2	47	0.39	0.40	0.20	0.40	0.10	0.10	0.05	0.10	0.35	20
Licuan	N.A.	36	3	32	0.43	0.40	0.20	0.40	0.11	0.10	0.05	0.10	0.36	19
Luba	N.A.	63	8	43	0.50	1.00	0.20	0.40	0.13	0.25	0.05	0.10	0.53	14
Malibcong	N.A.	23	100	41	N.A.	0.40	1.00	0.40	N.A.	0.20	0.25	0.10	0.55	10
Manabo	N.A.	8	42	40	0.39	0.20	0.60	0.40	0.10	0.05	0.15	0.10	0.40	17
Penarrubia	N.A.	9	0	0	0.23	0.20	0.20	0.20	0.06	0.05	0.05	0.05	0.21	27
Pidigan	N.A.	10	11	25	0.32	0.20	0.20	0.20	0.08	0.05	0.05	0.05	0.23	26
Pilar	N.A.	25	41	58	0.73	0.40	0.60	0.60	0.18	0.10	0.15	0.15	0.58	9
Sal-lapadan	N.A.	33	51	16	1.00	0.40	0.60	0.20	0.25	0.10	0.15	0.05	0.55	10
San Isidro	N.A.	14	11	34	0.60	0.20	0.20	0.40	0.15	0.05	0.05	0.10	0.35	20
San Juan	N.A.	28	20	65	0.56	0.40	1.00	0.60	0.14	0.10	0.25	0.15	0.64	6
San Quintin	N.A.	36	27	38	1.00	0.40	0.40	0.40	0.25	0.10	0.10	0.10	0.55	12
Tayum	N.A.	16	23	28	0.54	0.20	0.40	0.20	0.14	0.05	0.10	0.05	0.34	22
Tineg	N.A.	61	100	61	N.A.	1.00	1.00	0.60	N.A.	0.50	0.25	0.15	0.90	1
Tubo	N.A.	41	100	71	N.A.	0.60	1.00	0.80	N.A.	0.30	0.25	0.20	0.75	5
Villaviciosa	N.A.	11	23	38	0.32	0.20	0.40	0.40	0.08	0.05	0.10	0.10	0.33	23
Provincial Total	N.A.	23	23	54										

Note:

(1) Scoring to Underserved and Unserved Percentage.

Score	Range of Underserved and Unserved Percentage		
1.0	61 < %	81 < %	86 < %
0.8	51 < % < 60	61 < % < 80	71 < % < 85
0.6	41 < % < 50	41 < % < 60	51 < % < 70
0.4	21 < % < 40	21 < % < 40	31 < % < 50
0.2	% < 20	% < 20	% < 30

2) Assumed Weight by Sub-Sector for Synthetic Evaluation by Municipality.

0.25	0.25	0.25	0.25	Allocated Weight

Table 12.4.1 Draft Formats for Annual Sector Performance Summary Report (Provincial and Municipal Levels)

Form P-1

Province of _____
Provincial Water & Sanitation Monitoring System
Annual Sector Performance Summary Report
Period Covered : _____ to _____

I. Service Coverage

Municipality (1)	LAST YEAR				THIS YEAR			
	Population (2)	Persons with Safe Water & Sanitary Toilets (3)	Persons with Safe Water Only (4)	Persons with Sanitary Toilets Only (5)	Population (6)	Persons with Safe Water & Sanitary Toilets (7)	Persons with Safe Water Only (8)	Persons with Sanitary Toilets Only (9)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
Total								
% Served								
Targets								

II. Sources & Uses of Capital Development Funds

Source of Fund (1)	Budget for Water Supply & Sanitation (2)	Actual Disbursement (3)	Uses of Funds						
			Water Source Development (4)	Water Supply Transmission (5)	Water Storage/ Treatment & Distribution (6)	Household Toilets (7)	School Toilets (8)	Public Toilets (9)	Others (10)
A. Local Funds.									
Provincial Funds									
Municipal Funds									
A.									
B.									
C.									
D.									
E.									
F.									
G.									
H.									
I.									
J.									
SUB-TOTAL									
B. National Funds									
DPWH									
DOH									
LWUA									
SUB-TOTAL									
C. External Funds									
NGO									
NGO									
NGO									
SUB-TOTAL									
TOTAL									

III. School Sanitation (Source, DECS)

School (Location) (1)	No. of Students Enrolled (2)	Water Supply Adequate ? (Y/N) (3)	No. of Functioning Toilet Units (4)	Facility: Student Ratio (5)

IV. Incidence of Diarrhea (Source IPHO)

Month (1)	Last Year (2)	This Year (3)
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

V. Water Resources: Report any major changes in the availability and quality of water in the province. Attach map.

VI. Unit Cost Summary : Based on projects actually implemented and paid for during the reporting period, indicate the following average unit costs

1. Shallow Well (w/o hand pump) = _____ / Meter Depth
2. Deep Well (w/o pump) = _____ / Meter Depth
3. Pipeline = _____ / meter
4. Storage Tanks =
5. Others,

Municipality of _____

Form M - 1

Provincial Water & Sanitation Monitoring System

Annual Sector Performance Summary Report

Period Covered : _____ to _____

I. Service Coverage

	LAST YEAR				THIS YEAR			
Name of Barangay (1)	Population (2)	Persons with Safe Water & Sanitary Toilets (3)	Persons with Safe Water Only (4)	Persons with Sanitary Toilets Only (5)	Population (6)	Persons with Safe Water & Sanitary Toilets (7)	Persons with Safe Water Only (8)	Persons with Sanitary Toilets Only (9)
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
Total								
% Served								

II. Sources & Uses of Capital Development Funds.

Source of Funds (1)	Budget (2)	Actual Disbursement (3)	Uses of Funds						
			Water Source Development (4)	Water Supply Transmission (5)	Water Storage/ Treatment & Distribution (6)	Household Toilets (7)	School Toilets (8)	Public Toilets (9)	Others (10)
Municipal Funds									
Barangay Funds									
A.									
B.									
C.									
D.									
E.									
F.									
G.									
H.									
I.									
J.									
K.									
L.									
M.									
N.									
O.									
P.									
Q.									
R.									
S.									
T.									
U.									
W.									
SUB-TOTAL									
NGO									
NGO									
NGO									
SUB-TOTAL									
TOTAL									