Chapter 8

FUTURE REQUIREMENTS IN WATER SUPPLY AND SANITATION IMPROVEMENT

8. FUTURE REQUIREMENTS IN WATER SUPPLY AND SANITATION IMPROVEMENT

8.1 General

Phased investments for provincial sector development, Medium-Term Investment (2001-1005) and Long-Term Development (2006-2010), are planned in almost the same manner as adopted in the 1998 Philippine National Development Plan (PNDP), the National Sector Master Plan (NSMP) and Updated Medium-Term Philippine Development Plan.

Targets of provincial service coverage for the two phases are established as percentages of beneficiaries or utilities to be served by sub-sector. Service coverage in the base year (1998) and national sector targets indicated in the National Sector Master Plan (NSMP) and the updated Medium-Term Philippine Development Plan, 1996 - 1998 (MTPDP) are the bases of the study. Sector targets which are not prescribed in the national plan; school and public toilets as well as sewerage are assumed based on the current conditions. In addition, preliminary discussions on solid waste management are included as a vital component of sanitation sector.

Projection of frame values by municipality is undertaken for respective sub-sectors; future population by urban and rural area, the number of student enrollment to public schools and the number of public utilities. Reference base figures for the study of framework are the 1995 Census of Population and Housing, the statistical data of the province and the information from relevant agencies. Municipal population by target year and the base year (1998) is estimated referring to the NSO population census results (past 3 census periods: 1980 - 1995), the 1995 Census-based Regional and Provincial Population projection prepared by NSO and the Provincial Physical Framework Plan/Comprehensive Provincial Land Use Plan.

Types of required facilities and their implementation criteria according to service level standards are referred to the NSMP and the NEDA Board Resolution No. 12 (s. 1995). Some planning conditions and assumptions not prescribed in the national plan are conferred to the relevant standards of sector agencies and provincial government. For sewerage requirements, the deficit in sanitation must first be addressed. Partial upgrading of on-site disposal to a sewerage system (off-site disposal) is envisaged in the final target year.

In estimating future requirements by municipality, additional population (or number of students/public utilities) to be served by sub-sector is first calculated as a shortfall at target years in comparison between each target and its base year service coverage. In this regard,

planned/on-going projects to be completed by respective base years are considered as part of existing services for each target year. Required number of facilities by sector component is then estimated corresponding to the said additional population (or number of students/public utilities) to be served. Rehabilitation work for Level I facilities limited to new deep wells to be constructed under PW4SP is taken into account. Generally, rehabilitation of deep wells and shallow wells constructed by means of conventional method is difficult.

Logistic support is considered as a minimum requirement of LGUs for community development and training, and other relevant activities along with the implementation of PW4SP. The types and number of well drilling/rehabilitation equipment and supporting vehicle for Level I facilities are also suggested as reference information. Also, minimum requirements for setting up a provincial laboratory to support drinking water quality surveillance and monitoring are described. This will include building, instrument/equipment and reagent/chemical requirements. The 1993 Philippine National Standards for Drinking Water (PNSDW) requires that initial examinations of water from newly constructed sources should first be undertaken before operation for public use and henceforth periodic examinations of these water supply sources/facilities.

Project priority for medium-term development is discussed entailing general criteria to identify specific projects. However, at the provincial level master plan, it is suggested that municipal priority ranking be used for allocation of provincial fund.

8.2 Targets of Provincial Sector Plan

Provincial sector targets for the years 2005 and 2010 are determined as the provincial average of the desirable minimum level for each sub-sector. Table 8.2.1 summarizes the target percentages to be served by sub-sector. Details by sub-sector are discussed in this subsection.

(1) Water supply

The base year (1998) service coverage was calculated as a total of 1998 figures and expected by planned/on-going projects scheduled to be completed by 1999. Table 8.2.2 shows service coverage for the planning purpose (details are referred to Supporting Report).

The base year service coverage in urban area (69%) achieved the updated MTPDP sector target (69%) for the year 1998, while rural area (62%) is far behind the sector target of

79%. As identified in Chapter 4, lower service coverage in rural area is considered to arise from existence of high percentage of underserved population.

Table 8.2.1 Provincial Sector Targets

Sub-sector	Base Year Service Coverage	Phase I (2001-2005)		Phase II (2006-2010)	
Water Supply	Population Coverage (%)	Population Coverage (%)	Additional Population to be Served	Population Coverage (%)	Additional Population to be Served
Urban Water Supply	69	70	31,467	95	263,920
Rural Water Supply	62	65	127,272	93	461,804
Sanitation	Household Coverage (%)	Household Coverage (%)	Additional Households to be Served	Household Coverage (%)	Additional Households to be Served
Household Toilet					
Urban Area	86	93	11,221	93	34,400
Flush	7	15	5,703	50	33,918
Pour Flush	79	75	4,392	50	482
VIP/Dry	14	10	1,126	0	0
Rural Area	62	75	50,486	90	145,701
Flush	5	10	9,971	15	9,536
Pour Flush	74	80	32,671	85	136,165
VIP/Dry	21	10	7,844	0	0
School Toilet	Public School Student Coverage (%)	Public School Student Coverage (%)	Additional Public School Students to be Served	Public School Student Coverage (%)	Additional Public School Students to be Served
	47	70	111,438	90	120,121
Public Toilet	Public Utilities Coverage (%)	Public Utilities Coverage (%)	Additional Public Utilities with Sanitary Toilets	Public Utilities Coverage (%)	Additional Public Utilities with Sanitary Toilets
	97	100	158	100	210
Sewerage	Urban Population Coverage (%)	Not Applicable		Urban Population Coverage (%)	Urban Population to be Served
	0			50	108,599
Solid Waste	Urban Household Coverage (%)	Urban Household Coverage (%)	Additional Urban House-holds to be Served	Not Applicable	
	98	100	29,227		

Table 8.2.2 Estimation of Base Year Service Coverage of Water Supply

Name of Municipality	Area	Population (1998)	Population Served by 1998 Facilities				
			Level III	Level II	Level I	Total	Percentage Coverage
Ajuy	Urban	3,107	2,890			2,890	93
	Rural	36,148	4,490	2,300	17,788	24,578	68
	Total	39,255	7,380	2,300	17,788	27,468	70
Alimodian	Urban	6,776	3,240		1,926	5,166	76
	Rural	24,175		2,175	14,068	16,243	67
	Total	30,951	3,240	2,175	15,994	21,409	69
Anilao	Urban	1,806	1,104		152	1,256	70
	Rural	19,997	330		8,271	8,601	43
	Total	21,803	1,434		8,423	9,857	45
Badiangan	Urban	1,680	490		991	1,481	88
	Rural	22,011		250	20,771	21,021	96
	Total	23,691	490	250	21,762	22,502	95
Balasan	Urban	3,602			2,512	2,512	70
	Rural	20,328			14,190	14,190	70
	Total	23,930			16,702	16,702	70
Banate	Urban	1,517			1,214	1,214	80
	Rural	24,923			14,388	14,388	58
	Total	26,440			15,602	15,602	59
Barotac Nuevo	Urban	3,844	2,010		1,727	3,737	97
	Rural	38,608	1,635		36,119	37,754	98
	Total	42,452	3,645		37,846	41,491	98
Barotac Viejo	Urban	3,945			2,026	2,026	51
	Rural	31,560	2,880	1,575	15,667	20,122	64
	Total	35,505	2,880	1,575	17,693	22,148	62
Batad	Urban	1,168	780	75	74	929	80
	Rural	15,093		1,625	8,249	9,874	65
	Total	16,261	780	1,700	8,323	10,803	66
Bingawan	Urban	3,357			3,094	3,094	92
	Rural	8,731			3,009	3,009	34
	Total	12,088			6,103	6,103	50
Cabatuan	Urban	43,852	2,490	375	29,974	32,839	75
	Rural						
	Total	43,852	2,490	375	29,974	32,839	75
Calinog	Urban	5,014	1,764		1,202	2,966	59
	Rural	44,091	150		13,370	13,520	31
	Total	49,105	1,914		14,572	16,486	34
Carles	Urban	2,349			909	909	39
	Rural	46,979		2,425	11,712	14,137	30
	Total	49,328		2,425	12,621	15,046	31
Concepcion	Urban	4,455			2,154	2,154	48
	Rural	27,296		185	12,558	12,743	47
	Total	31,751		185	14,712	14,897	47
Dingle	Urban	5,917	1,960		2,770	4,730	80
	Rural	30,470	6,080	1,400	19,415	26,895	88
	Total	36,387	8,040	1,400	22,185	31,625	87
Dueñas	Urban	4,982	1,950		2,128	4,078	82
	Rural	24,784			16,712	16,712	67
	Total	29,766	1,950		18,840	20,790	70
Dumangas	Urban	1,884	1,165		184	1,349	72
	Rural	50,816	6,215	175	16,464	22,854	45
	Total	52,700	7,380	175	16,648	24,203	46

Table 8.2.2 Estimation of Base Year Service Coverage of Water Supply

(cont'd)

Name of Municipality	Area	Population (1998)	Population Served by 1998 Facilities				
			Level III	Level II	Level I	Total	Percentage Coverage
Estancia	Urban	7,965	3,270		2,616	5,886	74
	Rural	25,547			12,696	12,696	50
	Total	33,512	3,270		15,312	18,582	55
Guimbal	Urban	7,192	3,708		2,399	6,107	85
	Rural	21,473		275	13,689	13,964	65
	Total	28,665	3,708	275	16,088	20,071	70
Igbaras	Urban	5,332			3,165	3,165	59
	Rural	21,499		950	10,162	11,112	52
	Total	26,831		950	13,327	14,277	53
Janiuay	Urban	8,557	2,406		3,926	6,332	74
	Rural	44,163	168		26,896	27,064	61
	Total	52,720	2,574		30,822	33,396	63
Lambunao	Urban	4,484			1,261	1,261	28
	Rural	57,531			24,193	24,193	42
	Total	62,015			25,454	25,454	41
Leganes	Urban	6,921			3,804	3,804	55
	Rural	13,102		675	8,246	8,921	68
	Total	20,023		675	12,050	12,725	64
Lemery	Urban	2,729			2,168	2,168	79
	Rural	19,099		200	14,667	14,867	78
	Total	21,828		200	16,835	17,035	78
Leon	Urban	4,830	1,758		1,808	3,566	74
	Rural	39,667	1,350	1,350	23,774	26,474	67
	Total	44,497	3,108	1,350	25,582	30,040	68
Maasin	Urban	3,200	585		1,596	2,181	68
	Rural	26,869	730	25	15,236	15,991	60
	Total	30,069	1,315	25	16,832	18,172	60
Miagao	Urban	8,137	2,112		2,597	4,709	58
	Rural	45,369		875	25,826	26,701	59
	Total	53,506	2,112	875	28,423	31,410	59
Mina	Urban	2,319			1,404	1,404	61
	Rural	14,763			8,605	8,605	58
	Total	17,082			10,009	10,009	59
New Lucena	Urban	2,641			1,678	1,678	64
	Rural	14,498	270		9,984	10,254	71
	Total	17,139	270		11,662	11,932	70
Oton	Urban	60,873	2,625		21,787	24,412	40
	Rural						
	Total	60,873	2,625		21,787	24,412	40
Passi City	Urban	8,625	8,550	75		8,625	100
	Rural	53,085		125	39,292	39,417	74
	Total	61,710	8,550	200	39,292	48,042	78
Pavia	Urban	8,296	5,845		1,957	7,802	94
	Rural	20,904	7,010	1,025	10,290	18,325	88
	Total	29,200	12,855	1,025	12,247	26,127	89
Pototan	Urban	16,790	6,360		7,916	14,276	85
	Rural	42,002	435	100	27,968	28,503	68
	Total	58,792	6,795	100	35,884	42,779	73
San Dionisio	Urban	4,711	2,754		767	3,521	75
	Rural	21,843		1,925	9,253	11,178	51
	Total	26,554	2,754	1,925	10,020	14,699	55

Table 8.2.2 Estimation of Base Year Service Coverage of Water Supply

(cont'd)

Name of Municipality	Area	Population (1998)	Population Served by 1998 Facilities				
			Level III	Level II	Level I	Total	Percentage Coverage
San Enrique	Urban	2,112			1,243	1,243	59
	Rural	24,449			13,918	13,918	57
	Total	26,561			15,161	15,161	57
San Joaquin	Urban	4,484	1,303		1,960	3,263	73
	Rural	43,573	1,210	6,695	14,398	22,303	51
	Total	48,057	2,513	6,695	16,358	25,566	53
San Miguel	Urban	13,749	815		12,753	13,568	99
	Rural	6,170		425	5,661	6,086	99
	Total	19,919	815	425	18,414	19,654	99
San Rafael	Urban	3,144			2,782	2,782	88
	Rural	9,579			6,989	6,989	73
	Total	12,723			9,771	9,771	77
Santa Barbara	Urban	7,920	1,130		5,240	6,370	80
	Rural	33,801	1,315	150	26,017	27,482	81
	Total	41,721	2,445	150	31,257	33,852	81
Sara	Urban	3,852	582		2,792	3,374	88
	Rural	36,699	434	1,400	33,213	35,047	95
	Total	40,551	1,016	1,400	36,005	38,421	95
Tigbauan	Urban	8,335			5,618	5,618	67
	Rural	41,726		1,625	16,616	18,241	44
	Total	50,061		1,625	22,234	23,859	48
Tubungan	Urban	1,411		125	1,001	1,126	80
	Rural	19,075		1,300	12,981	14,281	75
	Total	20,486		1,425	13,982	15,407	75
Zarraga	Urban	3,134			2,093	2,093	67
	Rural	16,062			10,615	10,615	66
	Total	19,196			12,708	12,708	66
Provincial Total	Urban	310,998	63,646	650	149,368	213,664	69
	Rural	1,178,558	34,702	31,230	663,936	729,868	62
	Total	1,489,556	98,348	31,880	813,304	943,532	63

For Phase I development, targets of service coverage for water supply by urban and rural were set up considering the following conditions:

i) at least the existing service coverage shall be secured to meet population increase; and

ii) viable investment using available IRA to be allocated to water supply sector shall be considered.

Thus, the targets of 70% for urban and 65% for rural area, which are 1 - 3% increase from the existing service coverage, were established in the medium-term period, respectively.

Phase II targets are planned to increase urban and rural water supply coverage to 95% and 93%, respectively, as envisaged in the NSMP.

(2) Sanitation

1) Household toilets

As with water supply, the base year service coverage is calculated as shown in Table 8.2.3 reflecting any planned or on-going projects scheduled to be completed by 1999 (details are referred to Supporting Report).

The province has base year service coverage of 67%, which is above the current national average coverage of 60%. Urban area registers a level of 86% that is well above the national average coverage. While, rural area has 62%, a little above the national average coverage. By type of sanitary toilet facility, the existing percentage composition to total households is as follows:

Type	Urban (%)	Rural (%)
Flush	7	5
Pour-flush	79	74
VIP latrine	14	21

To attain sufficiency and equitable access to basic services, provincial target of Phase I for urban household toilets is planned at 93%, while, for rural household toilets, 75% is assumed. This is pursued to lessen the gap of the coverage between the urban and rural areas and to achieve a balanced distribution of this basic facility as embodied in the PNDP. For Phase II, 93% as set by the NSMP, is adopted both for urban and rural household toilets.

The existing composition of the 3 facility types serves as an indicator in the distribution for Phase I, while for Phase II, VIP and sanitary pit privy/latrine (dry-type) is phased-out.

2) School toilets

The base year service coverage of public school students is shown in Table 8.2.4 counting expected coverage of any planned or on-going projects scheduled to be completed by 1999 (details are referred to Supporting Report).

Table 8.2.3 Base Year Service Coverage of Household Toilets

Name of Municipality/ City	Area	1998		Households and Population Using Sanitary Toilets								
				Number of Households					Service Coverage (%)			
		Population	HHs	Flush	Pour Flush	VIP/Dry	Total	Population	Flush	Pour Flush	VIP/Dry	Total
Aiuy	Urban	3,107	591	10	353	26	389	2,051	2	60	4	66
	Rural	36,148	6,978		2,194	1,565	3,759	19,520		31	22	54
	Total	39,255	7,569	10	2,547	1,591	4,148	21,571		34	21	55
Alimodian	Urban	6,776	1,355	56	1,180		1,236	6,167	4	87		91
	Rural	24,175	4,356	373	2,340	607	3,320	18,373	9	54	14	76
	Total	30,951	5,711	429	3,520	607	4,556	24,540	8	62	11	80
Anilao	Urban	1,806	349	19	142		161	831	5	41		46
	Rural	19,997	3,731		922		922	5,000		25		25
	Total	21,803	4,080	19	1,064		1,083	5,831		26		27
Badiangan	Urban	1,680	327	38	262		300	1,546	12	80		92
	Rural	22,011	4,257	23	1,810	1,320	3,153	16,289	1	43	31	74
	Total	23,691	4,584	61	2,072	1,320	3,453	17,835	1	45	29	75
Balasan	Urban	3,602	694	40	337	155	532	2,774	6	49	22	77
	Rural	20,328	3,994	25	495	335	855	4,269	1	12	8	21
	Total	23,930	4,688	65	832	490	1,387	7,043	1	18	10	30
Banate	Urban	1,517	286		166		166	880		58		58
	Rural	24,923	4,624		1,672		1,672	8,973		36		36
	Total	26,440	4,910		1,838		1,838	9,853		37		37
Barotac	Urban	3,844	723	219	409		628	3,345	30	57		87
	Rural	38,608	7,354	183	4,060	115	4,358	22,779	2	55	2	59
	Total	42,452	8,077	402	4,469	115	4,986	26,124	5	55	1	62
Barotac Viejo	Urban	3,945	756	8	118	471	597	3,117	1	16	62	79
	Rural	31,560	5,770	2	291	1,278	1,571	8,522		5	22	27
	Total	35,505	6,526	10	409	1,749	2,168	11,639		6	27	33
Batad	Urban	1,168	247	26	22	27	75	351	11	9	11	30
	Rural	15,093	2,897	60	634	1,118	1,812	9,509	2	22	39	63
	Total	16,261	3,144	86	656	1,145	1,887	9,860	3	21	36	60
Bingawan	Urban	3,357	698	28	603		631	3,022	4	86		90
	Rural	8,731	1,712		1,038		1,038	5,326		61		61
	Total	12,088	2,410	28	1,641		1,669	8,348	1	68		69
Cabatuan	Urban	43,852	8,274		3,326	4,013	7,339	39,029		40	49	89
	Rural											
	Total	43,852	8,274		3,326	4,013	7,339	39,029		40	49	89
Calinog	Urban	5,014	962	194	244	438	876	4,563	20	25	46	91
	Rural	44,091	8,288	1,645	2,791	768	5,204	27,778	20	34	9	63
	Total	49,105	9,250	1,839	3,035	1,206	6,080	32,341	20	33	13	66
Carles	Urban	2,349	464	3	264		267	1,363	1	57		58
	Rural	46,979	8,781	1	3,369		3,370	17,853		38		38
	Total	49,328	9,245	4	3,633		3,637	19,216		39		39
Concepcion	Urban	4,455	800		671		671	3,743		84		84
	Rural	27,296	5,259		1,693		1,693	8,735		32		32
	Total	31,751	6,059		2,364		2,364	12,478		39		39
Dingle	Urban	5,917	1,198	59	1,130		1,189	5,858	5	94		99
	Rural	30,470	5,905		5,255		5,255	27,119		89		89
	Total	36,387	7,103	59	6,385		6,444	32,977	1	90		91
Dueñas	Urban	4,982	942	40	537	249	826	4,385	4	57	26	88
	Rural	24,784	4,685	4	1,296	1,451	2,751	14,623		28	31	59
	Total	29,766	5,627	44	1,833	1,700	3,577	19,008	1	33	30	64
Dumangas	Urban	1,884	383	22	330		352	1,734	6	86		92
	Rural	50,816	9,906	8	6,341		6,349	32,523		64		64
	Total	52,700	10,289	30	6,671		6,701	34,257		65		65
Estancia	Urban	7,965	1,506	193	534	249	976	5,178	13	35	17	65
	Rural	25,547	4,951	148	1,965	602	2,715	14,051	3	40	12	55
	Total	33,512	6,457	341	2,499	851	3,691	19,229	5	39	13	57

Table 8.2.3 Base Year Service Coverage of Household Toilets

(Cont'd)

Name of Municipality/ City	Area	1998		Households and Population Using Sanitary Toilets								
				Number of Households					Service Coverage (%)			
		Population	HHs	Flush	Pour Flush	VIP/Dry	Total	Population	Flush	Pour Flush	VIP/Dry	Total
Guimbal	Urban	7,192	1,289	49	1,142	56	1,247	6,977	4	89	4	97
	Rural	21,473	3,897	68	3,084	387	3,539	19,541	2	79	10	91
	Total	28,665	5,186	117	4,226	443	4,786	26,518	2	81	9	92
Igbaras	Urban	5,332	1,045		1,002		1,002	5,119		96		96
	Rural	21,499	4,266		2,319		2,319	11,610		54		54
	Total	26,831	5,311		3,321		3,321	16,729		63		63
Janiuay	Urban	8,557	1,681	83	1,598		1,681	8,557	5	95		100
	Rural	44,163	8,178		3,199	3,843	7,042	37,981		39	47	86
	Total	52,720	9,859	83	4,797	3,843	8,723	46,538	1	49	39	88
Lambunao	Urban	4,484	794		745		745	4,215		94		94
	Rural	57,531	10,164		7,655	800	8,455	47,751		75	8	83
	Total	62,015	10,958		8,400	800	9,200	51,966		77	7	84
Leganes	Urban	6,921	1,346	285	804	181	1,270	6,506	21	60	13	94
	Rural	13,102	2,440	42	1,635	353	2,030	10,875	2	67	14	83
	Total	20,023	3,786	327	2,439	534	3,300	17,381	9	64	14	87
Lemery	Urban	2,729	581	18	298	128	444	2,075	3	51	22	76
	Rural	19,099	3,812	41	530	1,879	2,450	12,224	1	14	49	64
	Total	21,828	4,393	59	828	2,007	2,894	14,299	1	19	46	66
Leon	Urban	4,830	906	39	839	14	892	4,734	4	93	2	98
	Rural	39,667	7,058	28	4,286	58	4,372	24,594		61	1	62
	Total	44,497	7,964	67	5,125	72	5,264	29,328	1	64	1	66
Maasin	Urban	3,200	540		540		540	3,200		100		100
	Rural	26,869	4,577	184	1,582	1,765	3,531	20,690	4	35	39	77
	Total	30,069	5,117	184	2,122	1,765	4,071	23,890	4	41	34	80
Miagao	Urban	8,137	1,477		1,303		1,303	7,161		88		88
	Rural	45,369	8,758		6,015		6,015	31,305		69		69
	Total	53,506	10,235		7,318		7,318	38,466		71		71
Mina	Urban	2,319	432	1	358		359	1,925		83		83
	Rural	14,763	2,709		1,683		1,683	9,154		62		62
	Total	17,082	3,141	1	2,041		2,042	11,079		65		65
New Lucena	Urban	2,641	516		400		400	2,060		78		78
	Rural	14,498	2,735		2,242		2,242	11,889		82		82
	Total	17,139	3,251		2,642		2,642	13,949		81		81
Oton	Urban	60,873	11,661	17	10,001		10,018	52,351		86		86
	Rural											
	Total	60,873	11,661	17	10,001		10,018	52,351		86		86
Passi City	Urban	8,625	1,621	11	1,264		1,275	6,814	1	78		79
	Rural	53,085	10,054	6	3,957		3,963	20,704		39		39
	Total	61,710	11,675	17	5,221		5,238	27,518		45		45
Pavia	Urban	8,296	1,559	513	585	278	1,376	7,301	33	38	18	88
	Rural	20,904	4,028	634	2,073	1,017	3,724	19,232	16	51	25	92
	Total	29,200	5,587	1,147	2,658	1,295	5,100	26,533	21	48	23	91
Pototan	Urban	16,790	3,115	269	1,991	730	2,990	16,119	9	64	23	96
	Rural	42,002	8,016	689	2,626	2,724	6,039	31,502	9	33	34	75
	Total	58,792	11,131	958	4,617	3,454	9,029	47,621	9	41	31	81
San Dionisio	Urban	4,711	920	17	204	22	243	1,225	2	22	2	26
	Rural	21,843	4,176	27	738	897	1,662	8,738	1	18	21	40
	Total	26,554	5,096	44	942	919	1,905	9,963	1	18	18	37
San Enrique	Urban	2,112	396	145	223		368	1,965	37	56		93
	Rural	24,449	4,596	363	980	725	2,068	11,003	8	21	16	45
	Total	26,561	4,992	508	1,203	725	2,436	12,968	10	24	15	49
San Joaquin	Urban	4,484	812	52	602	10	664	3,677	6	74	1	82
	Rural	43,573	7,712	54	4,156	43	4,253	23,966	1	54	1	55
	Total	48,057	8,524	106	4,758	53	4,917	27,643	1	56	1	58

Table 8.2.3 Base Year Service Coverage of Household Toilets

(Cont'd)

Name of Municipality/ City	Area	1998		Households and Population Using Sanitary Toilets								
				Number of Households					Service Coverage (%)			
		Population	HHs	Flush	Pour Flush	VIP/Dry	Total	Population	Flush	Pour Flush	VIP/Dry	Total
San Miguel	Urban	13,749	2,634		2,422		2,422	12,650		92		92
	Rural	6,170	1,205		1,042		1,042	5,307		86		86
	Total	19,919	3,839		3,464		3,464	17,957		90		90
San Rafael	Urban	3,144	601		251		251	1,321		42		42
	Rural	9,579	1,717		467		467	2,587		27		27
	Total	12,723	2,318		718		718	3,908		31		31
Santa Barbara	Urban	7,920	1,506	882	521		1,403	7,366	59	35		93
	Rural	33,801	6,589	2,238	2,215	611	5,064	26,027	34	34	9	77
	Total	41,721	8,095	3,120	2,736	611	6,467	33,393	39	34	8	80
Sara	Urban	3,852	761	2	337	137	476	2,427		44	18	63
	Rural	36,699	7,168		1,647	2,067	3,714	19,084		23	29	52
	Total	40,551	7,929	2	1,984	2,204	4,190	21,511		25	28	53
Tigbauan	Urban	8,335	1,499	135	1,218		1,353	7,502	9	81		90
	Rural	41,726	7,829	160	5,186		5,346	28,374	2	66		68
	Total	50,061	9,328	295	6,404		6,699	35,876	3	69		72
Tubungan	Urban	1,411	269	55	208	3	266	1,397	20	77	1	99
	Rural	19,075	3,462		2,254	820	3,074	16,977		65	24	89
	Total	20,486	3,731	55	2,462	823	3,340	18,374	1	66	22	90
Zarraga	Urban	3,134	604	152	368	38	558	2,884	25	61	6	92
	Rural	16,062	2,969	41	1,818	945	2,804	15,099	1	61	32	94
	Total	19,196	3,573	193	2,186	983	3,362	17,983	5	61	28	94
Provincial Total	Urban	310,998	59,120	3,680	39,852	7,225	50,757	267,465	6	67	12	86
	Rural	1,178,55	221,563	7,047	101,555	28,093	136,695	727,456	3	46	13	62
	Total	1,489,55	280,683	10,727	141,407	35,318	187,452	994,921	4	50	13	67

Base year service coverage is 47% applying the standard number of public school students to be served by one (1) unit of toilet facility. The low level is due to a large number of unsanitary or absence of facilities.

In the absence of national targets for school toilets, the existing level of service coverage is the base in setting up the targets. It is expected that all new construction of school-buildings will entail sanitary toilets enabling the coverage to increase on a high level. For Phase I and II, 70% and 90% are set, respectively.

3) Public toilets

The base year service coverage considering expected additional coverage by 1999 is shown in Table 8.2.4 (details are referred to Supporting Report).

Table 8.2.4 Base Year Service Coverage of Public School Toilets and Public Toilets

Name of Municipality/City	Public School Toilets			Public Toilets		
	Total Number of Public School Students (1998)	Std. No. of Public School Student that can be Served by Base Year (1998) Sanitary Toilets	Service Coverage (%)	Number of Public Utilities with Toilets in 1998	Number of Public Utility with Sanitary Toilets in Base Year (1998)	Service Coverage (%)
Aiuy	9,749	4,040	41			
Alimodian	5,271	80	2	8	8	100
Anilao	5,408	2,080	38	4	4	100
Badiangan	4,420	4,420	100	5	5	100
Balasan	6,065	1,640	27	4	4	100
Banate	7,083	3,960	56	6	6	100
Barotac Nuevo	7,049			6	6	100
Barotac Viejo	8,149	2,920	36	15	15	100
Batad	2,707	2,707	100	14	14	100
Bingawan	3,008	80	3	4	4	100
Cabatuan	7,790	5,120	66	8	8	100
Calinog	11,029	5,560	50	6	6	100
Carles	11,821	5,600	47	4		
Concepcion	7,137	3,920	55	10	10	100
Dingle	7,493	3,840	51	4	4	100
Dueñas	7,209	4,920	68	3	3	100
Dumangas	8,569	6,720	78	7	7	100
Estancia	8,104	8,104	100	4	4	100
Guimbal	6,565	920	14	6	6	100
Igbaras	6,202	80	1	2	2	100
Janiuay	11,476	4,480	39	19	19	100
Lambunao	13,033	6,960	53	2	2	100
Leganes	6,070	2,680	44	4	4	100
Lemery	5,292	3,360	63			
Leon	10,415	6,160	59	8	8	100
Maasin	7,241	4,720	65	8	8	100
Miagao	11,281	9,120	81	10	10	100
Mina	3,768	3,120	83	2	2	100
New Lucena	4,780	2,560	54	12	12	100
Oton	12,723	2,760	22	10	10	100
Passi City	15,663	8,760	56	39	33	85
Pavia	6,167	2,760	45	4	4	100
Pototan	11,532	240	2	8	8	100
San Dionisio	7,072	3,800	54	4	4	100
San Enrique	5,209	1,560	30	2	2	100
San Joaquin	9,571	1,800	19	10	10	100
San Miguel	5,332	2,920	55	4	4	100
San Rafael	3,588	1,480	41	2	2	100
Santa Barbara	7,070	7,070	100	12	12	100
Sara	9,107	3,240	36	8	8	100
Tigbauan	6,409	1,480	23	4	4	100
Tubungan	3,718	2,280	61	6	6	100
Zarraga	1,800	440	24	3	3	100
Provincial Total	319,145	150,461	47	301	291	97

Almost all existing public utilities are served with at least one sanitary toilet giving a 97% coverage. This can be attributed by the fact that almost all public utilities (mostly public markets) are provided with sanitary toilet facilities.

Without national targets as of now, the indicator in setting up provincial targets would be the existing level of coverage. Accordingly, 100% coverage for both Phase I and Phase II are assumed.

(3) Sewerage

Given the non-existence of sewerage systems in any municipality at the present time, this plan does not consider the service during Phase I. For Phase II, a target of 50% coverage was applied to urban population of municipalities with more than 10,000 urban population provided by Level III water supply systems.

(4) Solid waste

The municipal level data in 1998 on the number of households served by the municipal refuse collection revealed that the current practice is concentrated to urban areas. The base year service coverage for urban area by municipality is reflected in Table 8.2.5.

About 21% of the total households in the province relied on municipal refuse collection using trucks or 98% urban household coverage. These municipalities have a total of 47 units of collection truck.

No national targets have yet been set. However, considering the present level of coverage, a 100% urban household coverage is applied for the medium-term period (2001-2005).

Table 8.2.5 Base Year Service Coverage of Municipal Solid Waste System in 1998

Name of Municipality/City	Total No. of Households	No. of Urban Households	No. of Households Served	Coverage of Households (%)	Coverage of Urban Households (%)
Aiuy	7,569	591	1,087	14	100
Alimodian	5,711	1,355	658	12	49
Anilao	4,080	349	254	6	73
Badiangan	4,584	327	338	7	100
Balasan	4,688	694	612	13	88
Banate	4,910	286	875	18	100
Barotac Nuevo	8,077	723	711	9	98
Barotac Viejo	6,526	756	777	12	100
Batad	3,144	247	1,631	52	100
Bingawan	2,410	698	359	15	51
Cabatuan	8,274	8,274	1,857	22	22
Calinog	9,250	962	3,978	43	100
Carles	9,245	464	3,953	43	100
Concepcion	6,059	800	642	11	80
Dingle	7,103	1,198	2,594	37	100
Dueñas	5,627	942	913	16	97
Dumangas	10,289	383	1,989	19	100
Estancia	6,457	1,506	2,127	33	100
Guimbal	5,186	1,289	1,029	20	80
Igbaras	5,311	1,045	250	5	24
Janiuay	9,859	1,681	2,108	21	100
Lambunao	10,958	794	2,984	27	100
Leganes	3,786	1,346	230	6	17
Lemery	4,393	581	295	7	51
Leon	7,964	906	1,564	20	100
Maasin	5,117	540	527	10	98
Miagao	10,235	1,477	1,371	13	93
Mina	3,141	432	832	26	100
New Lucena	3,251	516	273	8	53
Oton	11,661	11,661	2,070	18	18
Passi City	11,675	1,621	3,445	30	100
Pavia	5,587	1,559	1,558	28	100
Pototan	11,131	3,115	4,464	40	100
San Dionisio	5,096	920	2,024	40	100
San Enrique	4,992	396	875	18	100
San Joaquin	8,524	812	855	10	100
San Miguel	3,839	2,634	701	18	27
San Rafael	2,318	601	200	9	33
Santa Barbara	8,095	1,506	2,245	28	100
Sara	7,929	761	1,859	23	100
Tigbauan	9,328	1,499	458	5	31
Tubungan	3,731	269	399	11	100
Zarraga	3,573	604	206	6	34
Provincial Total	280,683	59,120	58,177	21	98

8.3 Projection of Frame Values

8.3.1 Population Projection

Future population for all municipalities by urban and rural areas was projected for the target years of 2005 and 2010 together with the present population in 1998 as a planning base year.

The future regional and provincial population has been projected by the NSO, while the projections at municipal levels were not available during the study. The future population of LGUs was therefore projected (details are included in the Supporting Report). Available information for the study at present is as follows:

NSO population census results from 1980 to 1995

1995 Census-based Regional and Provincial Population Projection prepared by the NSO

Provincial Physical Framework Plan/Comprehensive Provincial Land Use Plan (1993-2002) prepared by the Provincial Office

(1) 1995 Census-Based Regional and Provincial Population Projections: NSO

The NSO conducted regional and provincial projections for the period 1995-2020. The assumptions take into account future trends in the demographic processes of fertility, mortality and migration required by the cohort-component method for projecting population. The 1995 Population Census was used as the basis for the projection.

In the regional population projection, the subject region for this study; Region VI is classified as the medium-sized region (at least 5 million but less than 10 million by year 2000). The following are the result of projection for the region and the province of Iloilo in 2000, 2005 and 2010.

Table 8.3.1 Regional and Provincial Population Projection by NSO

Year		1980	1990	1995	2000	2005	2010
Region VI	Population	4,525,615	5,393,333	5,756,623	6,328,671	6,890,447	7,428,329
	Growth Rate	-	1.77%	1.31%	1.91%	1.72%	1.51%
Iloilo	Population	1,341,259	1,647,486	1,743,302	1,916,707	2,086,833	2,249,494
	Growth Rate	-	2.07%	1.14%	1.91%	1.72%	1.51%

Note: Average annual growth rates: geometric growth rate
Provincial population in 1980:referred to Land Use Plan (excluding the population in Guimaras)
Provincial population in 1995 as of Sep.1, 1995 was 1,749,561 (1995 Census)

In the past development, annual growth rates of the region and province between 1990 and 1995 decreased compared with those of previous census period. The growth rate of the province, in particular, decreased to almost half (1.14%) of that between 1980 and 1990 (2.07%). However, the NSO adopted the same growth rates through the future for the region and the province of Iloilo considering the previous development for its pro-

jection. Thus, the growth rates of the region and province with 5-year interval between 1995 and 2010 are assumed at 1.91%, 1.72% and 1.51%, respectively.

(2) The Land Use Plan: Province of Iloilo (Planning period 1993-2002)

The population projection on the provincial total and component municipalities together with the regional population was made with a base year 1990. The population for the year 2002 was projected using a uniform growth rate between 1990 and 2002 referring to the experience from 1980 to 1990 (census years).

In comparison between Land Use Plan and NSO's projection for year 2002, the projected population of the province in Land Use Plan is 6% higher than that in NSO's projection.

Regarding the projected municipal population in 1995, that of thirty-six (36) out of 43 municipalities/city is higher than that of NSO with a range of 2% to 15%, while that of remaining seven (7) municipalities is lower with a range of -0.3% to -9%.

Thus, future projection shall be made using 1995 census results as a base year. While, the regional and provincial population projected by the NSO may be adopted in this PW4SP, since the difference from the population projected in the Land Use Plan is less than 10%.

(3) Population Projection of the Province

The following conditions are considered in the population projection.

Regional and Provincial Population

For the regional and provincial population in the study, the projection conducted by NSO shall be adopted. Table 8.3.2 shows the projected population of the region VI and component provinces.

Table 8.3.2 Projected Population by the NSO

Province	Census Population	Projected Population/Growth Rate					
		Population			Average Annual Growth Rate		
	1995	1998	2005	2010	1995-2000	2000-2005	2005-2010
Aklan	408,949	432,359	487,839	528,072	1.84%	1.72%	1.60%
Antique	430,363	455,051	512,755	554,797	1.84%	1.69%	1.59%
Capiz	622,034	657,975	742,312	801,742	1.86%	1.71%	1.55%
Guimaras	126,034	133,422	150,680	162,774	1.88%	1.72%	1.56%
Iloilo	**1,743,302**	**1,847,328**	**2,086,833**	**2,249,494**	**1.91%**	**1.72%**	**1.51%**
Negros Occidental	2,425,941	2,573,658	2,910,028	3,131,450	1.95%	1.72%	1.48%
Region VI	5,756,623	6,099,793	6,890,447	7,428,329	1.91%	1.72%	1.51%

(Source) NSO, (Note) Provincial population in 1995 as of Sep. 1, 1995 was 1,749,561 (1995 Census)

Municipal Population

1) The total population of the province in 1998, 2005 and 2010 was fixed.
2) Municipal population for short/medium-term target years (1998 and 2005) is estimated using the recorded growth rates between 1990 and 1995. The municipal population estimated initially is adjusted in proportion to the population size of each municipality to the total provincial population, to meet the above mentioned provincial population fixed for the years 1998 and 2005.

For the year 2010 in the long-term, it is assumed that the tendency of population growth of respective municipalities will be stable reflecting the experiences in the past long term between 1980 and 1995. Thus, experienced growth rate between 1980 and 1995 by municipality is firstly applied to project 2010 population from the year 2005. Then, the municipal population initially estimated is adjusted in the same manner mentioned above. Table 8.3.3 presents census results (1980, 1990 and 1995) and projected population of the municipalities.

Population by Urban and Rural Area

1) Past population development

With regards to the ratio of the urban population of the study area to the total population, the averages in 1980 and 1990 were 13.2% and 15.1%. Likewise, it increased to 20.8% in 1995. The average growth rate of 3.39% (1980 - 1990) increased to 7.85% in 1995. With regard to rural population, the growth rates as provincial average were 1.78% (1980 - 1990) and -0.26% (1990 - 1995).

2) Projection of urban and rural population for the years 1998, 2005 and 2010

Urban population by municipality for the target years was at first projected and rural population was calculated to meet aforementioned total population fixing the urban population.

In the projection of municipal urban population, the following are assumed by short/medium-term and long-term.

Short/Medium-term target: 1998 and 2005

The share of urban population in 1995 in terms of the profile of urban population to total population by municipality were basically adopted, assuming that the latest profile will not change drastically in short/medium-term period.

Table 8.3.3 Census results and Projected Population of Municipalities

Municipality/City	Census Result					Projected Population/Growth Rate								
				GR		1998			2005			2010		
	1980	1990	1995	1990-1995	1980-1995	Population Initial	Population Adjust.	GR	Population Initial	Population Adjust.	GR	Population Initial	Population Adjust.	GR
Ajuy	30,397	38,108	38,415	0.16%	1.57%	38,690	39,255	0.72%	39,036	41,023	0.66%	42,205	43,417	1.14%
Alimodian	22,906	27,199	29,179	1.42%	1.63%	30,436	30,951	1.99%	33,582	35,291	1.92%	36,404	37,449	1.19%
Anilao	15,782	19,551	20,711	1.16%	1.83%	21,440	21,803	1.73%	23,242	24,424	1.66%	25,446	26,176	1.48%
Badiangan	19,239	21,984	22,795	0.73%	1.14%	23,296	23,691	1.29%	24,508	25,755	1.23%	25,933	26,678	0.71%
Balasan	17,979	22,010	22,949	0.84%	1.64%	23,532	23,930	1.41%	24,949	26,218	1.34%	27,063	27,841	1.21%
Banate	17,710	23,360	24,976	1.35%	2.32%	25,999	26,440	1.91%	28,551	30,004	1.85%	32,018	32,937	1.88%
Barotac Nuevo	34,276	39,706	40,968	0.63%	1.20%	41,744	42,452	1.19%	43,614	45,833	1.13%	46,285	47,614	0.77%
Barotac Viejo	24,135	31,651	33,652	1.23%	2.24%	34,913	35,505	1.80%	38,042	39,977	1.74%	42,499	43,720	1.81%
Batad	11,790	14,327	15,345	1.38%	1.77%	15,990	16,261	1.95%	17,603	18,499	1.89%	19,219	19,771	1.34%
Bingawan	9,229	10,868	11,494	1.13%	1.47%	11,887	12,088	1.69%	12,856	13,510	1.63%	13,832	14,229	1.01%
Cabatuan	34,468	40,873	42,264	0.67%	1.37%	43,121	43,852	1.24%	45,190	47,489	1.17%	48,368	49,757	0.94%
Calinog	32,897	41,093	45,452	2.04%	2.18%	48,286	49,105	2.61%	55,606	58,435	2.54%	61,933	63,712	1.74%
Carles	32,184	42,643	46,218	1.62%	2.44%	48,505	49,328	2.19%	54,292	57,055	2.13%	61,253	63,012	2.01%
Concepcion	21,121	28,347	30,111	1.21%	2.39%	31,222	31,751	1.78%	33,975	35,704	1.72%	38,238	39,337	1.96%
Dingle	29,179	35,405	35,639	0.13%	1.34%	35,780	36,387	0.69%	36,112	37,949	0.63%	38,601	39,710	0.91%
Dueñas	23,962	28,435	28,954	0.36%	1.27%	29,270	29,766	0.93%	30,021	31,548	0.86%	31,975	32,894	0.84%
Dumangas	41,241	49,899	51,092	0.47%	1.44%	51,821	52,700	1.04%	53,564	56,290	0.97%	57,528	59,181	1.01%
Estancia	19,817	27,217	30,673	2.42%	2.96%	32,954	33,512	3.00%	38,957	40,939	2.93%	45,064	46,358	2.52%
Guimbal	19,502	23,470	26,316	2.32%	2.02%	28,187	28,665	2.89%	33,085	34,769	2.82%	36,561	37,611	1.58%
Igbaras	22,173	25,269	25,960	0.54%	1.06%	26,384	26,831	1.11%	27,399	28,793	1.04%	28,878	29,707	0.63%
Janiuay	40,120	47,242	50,066	1.17%	1.49%	51,841	52,720	1.74%	56,231	59,092	1.67%	60,539	62,277	1.06%
Lambunao	45,435	55,317	58,792	1.23%	1.73%	60,981	62,015	1.79%	66,411	69,790	1.73%	72,368	74,447	1.30%
Leganes	14,285	18,501	19,235	0.78%	2.00%	19,689	20,023	1.35%	20,792	21,849	1.28%	22,959	23,619	1.57%
Lemery	15,707	19,899	20,863	0.95%	1.91%	21,464	21,828	1.52%	22,933	24,100	1.45%	25,209	25,933	1.48%
Leon	31,552	36,891	41,043	2.16%	1.77%	43,755	44,497	2.73%	50,301	53,386	2.66%	55,456	57,049	1.34%
Maasin	26,962	29,028	29,364	0.23%	0.57%	29,567	30,069	0.79%	30,048	31,577	0.73%	30,915	31,803	0.14%
Miagao	45,816	51,717	52,276	0.22%	0.88%	52,614	53,506	0.78%	53,412	56,139	0.71%	55,813	57,416	0.45%
Mina	12,290	15,807	16,419	0.76%	1.95%	16,798	17,082	1.33%	17,715	18,616	1.26%	19,511	20,071	1.52%
New Lucena	13,457	16,906	16,873	-0.04%	1.52%	16,853	17,139	0.52%	16,807	17,662	0.46%	18,424	18,644	1.09%
Oton	41,044	52,097	56,821	1.75%	2.19%	59,859	60,873	2.31%	67,593	71,032	2.26%	75,333	77,497	1.76%
Passi	47,988	57,683	59,539	0.64%	1.45%	60,681	61,710	1.20%	63,432	66,660	1.14%	68,160	70,118	1.02%
Pavia	17,330	23,786	26,756	2.38%	2.94%	28,713	29,200	2.96%	33,855	35,577	2.89%	39,129	40,252	2.50%
Pototan	44,624	53,970	56,340	0.86%	1.57%	57,812	58,792	1.43%	61,397	64,521	1.37%	66,358	68,264	1.13%
San Dionisio	19,410	23,910	25,263	1.11%	1.77%	26,111	26,554	1.68%	28,203	29,638	1.61%	30,793	31,677	1.34%
San Enrique	19,663	24,697	25,576	0.70%	1.77%	26,118	26,561	1.27%	27,429	28,825	1.20%	29,941	30,801	1.34%
San Joaquin	34,525	39,942	44,368	2.12%	1.69%	47,256	48,057	2.70%	54,746	57,531	2.63%	59,520	61,229	1.25%
San Miguel	14,241	17,605	18,819	1.34%	1.88%	19,587	19,919	1.91%	21,504	22,598	1.85%	24,798	25,511	2.45%
San Rafael	8,742	11,195	12,000	1.40%	2.13%	12,511	12,723	1.97%	13,788	14,489	1.90%	16,103	16,565	2.71%
Santa Barbara	32,693	37,502	39,667	1.13%	1.30%	41,026	41,721	1.70%	44,379	46,637	1.63%	49,742	51,171	1.87%
Sara	28,838	36,697	38,652	1.04%	1.97%	39,875	40,551	1.61%	42,880	45,062	1.55%	49,683	51,110	2.55%
Tigbauan	34,540	43,902	47,158	1.44%	2.10%	49,226	50,061	2.01%	54,412	57,181	1.95%	63,435	65,257	2.68%
Tubungan	14,510	15,936	18,450	2.97%	1.61%	20,145	20,486	3.55%	24,730	25,989	3.49%	28,155	28,964	2.19%
Zarraga	12,673	15,471	17,519	2.52%	2.18%	18,876	19,196	3.09%	22,464	23,607	3.03%	26,298	27,053	2.76%
StudyDArea	1,096,4	1,337,1	1,415,0	1.14%	1.72%	1,464,7	1,489,5	1.73%	1,590,1	1,671,0	1.68%	1,747.6	1,797.8	1.47%
Iloilo City	244,827	307,620	334,539	1.69%	2.10%	351,808	357,772	2.26%	395,650	415,781	2.20%	439,043	451,653	1.67%
province	1,341,2	1,644,7	1,749,5	1.24%	1.79%	1,816,5	1,847,3	1.83%	1,985,7	2,086,8	1.78%	2,186.6	2,249.4	1.51%

Note: Growth rates in 1998, 2005 and 2010 were calculated using geometric formula.

Long-term target: 2010

For the long-term projection, the recorded growth rates of urban population between 1980 and 1995 may be applied for the municipal population in 2010, assuming that the tendency of urban population will be stable reflecting the experiences in the past long term.

However, for the municipality of Borotac Nuevo, the urban population in 2005 was fixed to avoid negative growth of the population in 2010.

In addition, some modifications were made as follows:

- Dingle, Leganes, Pavia, Pototan and San Miguel; Shares of the urban population in 2005 were applied, since the growth rates of urban population between 1980 and 1995 were considerably high (more than 5%).
- San Enrique and San Rafael; Growth rates between 1990 and 1995 were applied, since the growth rates between 1980 and 1990 were not available due to no urban population in 1980 Census time.

Under the above assumptions, provincial average share of urban population for the year 2010 arrived at 21.0% which is almost same as the figure (20.9%) in 1995. Table 8.3.4 (a) and (b) present projected urban and rural population. The growth rates and shares on rural population are calculated using estimated rural population.

Table 8.3.4 (a) Population Projection by Urban and Rural Area:1998, 2005 and 2010

	Municipality/City	1998		2005			2010			
		Total	Urban/ Rural	Total	Urban/ Rural	Share (%)	Total	Urban/ Rural	G.R. (%)	Share (%)
Urban Area	Ajuy	39,255	3,107	41,023	3,247	7.9%	43,417	3,491	1.46%	8.0%
	Alimodian	30,951	6,776	35,291	7,726	21.9%	37,449	8,190	1.17%	21.9%
	Anilao	21,803	1,806	24,424	2,024	8.3%	26,176	2,220	1.87%	8.5%
	Badiangan	23,691	1,680	25,755	1,826	7.1%	26,678	2,015	1.99%	7.6%
	Balasan	23,930	3,602	26,218	3,946	15.1%	27,841	3,972	0.13%	14.3%
	Banate	26,440	1,517	30,004	1,721	5.7%	32,937	1,807	0.98%	5.5%
	Barotac	42,452	3,844	45,833	4,151	9.1%	47,614	4,151	0.00%	8.7%
	Barotac Viejo	35,505	3,945	39,977	4,442	11.1%	43,720	4,795	1.54%	11.0%
	Batad	16,261	1,168	18,499	1,328	7.2%	19,771	1,367	0.58%	6.9%
	Bingawan	12,088	3,357	13,510	3,752	27.8%	14,229	4,123	1.91%	29.0%
	Cabatuan	43,852	43,852	47,489	47,489	100.0%	49,757	49,757	0.94%	100.0%
	Calinog	49,105	5,014	58,435	5,967	10.2%	63,712	6,469	1.63%	10.2%
	Carles	49,328	2,349	57,055	2,717	4.8%	63,012	2,921	1.46%	4.6%
	Concepcion	31,751	4,455	35,704	5,010	14.0%	39,337	5,999	3.67%	15.2%
	Dingle	36,387	5,917	37,949	6,171	16.3%	39,710	6,457	0.91%	16.3%
	Dueñas	29,766	4,982	31,548	5,280	16.7%	32,894	5,844	2.05%	17.8%
	Dumangas	52,700	1,884	56,290	2,013	3.6%	59,181	2,038	0.25%	3.4%
	Estancia	33,512	7,965	40,939	9,730	23.8%	46,358	10,766	2.04%	23.2%
	Guimbal	28,665	7,192	34,769	8,724	25.1%	37,611	9,543	1.81%	25.4%
	Igbaras	26,831	5,332	28,793	5,722	19.9%	29,707	6,275	1.86%	21.1%
	Janiuay	52,720	8,557	59,092	9,591	16.2%	62,277	10,086	1.01%	16.2%
	Lambunao	62,015	4,484	69,790	5,046	7.2%	74,447	5,398	1.36%	7.3%
	Leganes	20,023	6,921	21,849	7,553	34.6%	23,619	8,164	1.57%	34.6%
	Lemery	21,828	2,729	24,100	3,013	12.5%	25,933	3,396	2.42%	13.1%
	Leon	44,497	4,830	53,386	5,795	10.9%	57,049	6,143	1.17%	10.8%
	Maasin	30,069	3,200	31,577	3,360	10.6%	31,803	3,408	0.28%	10.7%
	Miagao	53,506	8,137	56,130	8,536	15.2%	57,416	9,079	1.24%	15.8%
	Mina	17,082	2,319	18,616	2,527	13.6%	20,071	2,843	2.38%	14.2%
	New Lucena	17,139	2,641	17,662	2,722	15.4%	18,644	2,941	1.56%	15.8%
	Oton	60,873	60,873	71,032	71,032	100.0%	77,497	77,497	1.76%	100.0%
	Passi	61,710	8,625	66,660	9,317	14.0%	70,118	10,084	1.59%	14.4%
	Pavia	29,200	8,296	35,577	10,108	28.4%	40,252	11,437	2.50%	28.4%
	Pototan	58,792	16,790	64,521	18,426	28.6%	68,264	19,495	1.13%	28.6%
	San Dionisio	26,554	4,711	29,638	5,258	17.7%	31,677	6,389	3.97%	20.2%
	San Enrique	26,561	2,112	28,825	2,292	8.0%	30,801	2,360	0.58%	7.7%
	San Joaquin	48,057	4,484	57,531	5,368	9.3%	61,229	5,745	1.37%	9.4%
	San Miguel	19,919	13,749	22,598	15,599	69.0%	25,511	17,609	2.45%	69.0%
	San Rafael	12,723	3,144	14,489	3,580	24.7%	16,565	3,715	0.74%	22.4%
	Santa Barbara	41,721	7,920	46,637	8,853	19.0%	51,171	9,206	0.78%	18.0%
	Sara	40,551	3,852	45,062	4,281	9.5%	51,110	4,321	0.19%	8.5%
	Tigbauan	50,061	8,335	57,181	9,521	16.7%	65,257	10,461	1.90%	16.0%
	Tubungan	20,486	1,411	25,989	1,790	6.9%	28,964	2,042	2.66%	7.0%
	Zarraga	19,196	3,134	23,607	3,854	16.3%	27,053	4,224	1.85%	15.6%
	Study Area	**1,489,555**	**311,001**	**1,671,052**	**350,408**	**21.0%**	**1,797,841**	**378,243**	**1.54%**	**21.0%**

Table 8.3.4 (b) Population Projection by Urban and Rural Area:1998, 2005 and 2010

	Municipality/City	1998		2005			2010			
		Total	Urban/ Rural	Total	Urban/ Rural	Share (%)	Total	Urban/ Rural	G.R. (%)	Share (%)
Rural Area	Ajuy	39,255	36,147	41,023	37,775	92.1%	43,417	39,926	1.11%	92.0%
	Alimodian	30,951	24,175	35,291	27,565	78.1%	37,449	29,259	1.20%	78.1%
	Anilao	21,803	19,997	24,424	22,400	91.7%	26,176	23,956	1.35%	91.5%
	Badiangan	23,691	22,011	25,755	23,929	92.9%	26,678	24,664	0.61%	92.4%
	Balasan	23,930	20,329	26,218	22,272	84.9%	27,841	23,869	1.39%	85.7%
	Banate	26,440	24,923	30,004	28,282	94.3%	32,937	31,130	1.94%	94.5%
	Barotac	42,452	38,608	45,833	41,682	90.9%	47,614	43,464	0.84%	91.3%
	Barotac Viejo	35,505	31,560	39,977	35,535	88.9%	43,720	38,925	1.84%	89.0%
	Batad	16,261	15,093	18,499	17,170	92.8%	19,771	18,404	1.40%	93.1%
	Bingawan	12,088	8,731	13,510	9,758	72.2%	14,229	10,106	0.70%	71.0%
	Cabatuan	43,852	0	47,489	0	0.0%	49,757	0	-	0.0%
	Calinog	49,105	44,091	58,435	52,469	89.8%	63,712	57,243	1.76%	89.8%
	Carles	49,328	46,979	57,055	54,338	95.2%	63,012	60,092	2.03%	95.4%
	Concepcion	31,751	27,296	35,704	30,694	86.0%	39,337	33,338	1.67%	84.8%
	Dingle	36,387	30,470	37,949	31,778	83.7%	39,710	33,253	0.91%	83.7%
	Dueñas	29,766	24,784	31,548	26,268	83.3%	32,894	27,050	0.59%	82.2%
	Dumangas	52,700	50,815	56,290	54,277	96.4%	59,181	57,142	1.03%	96.6%
	Estancia	33,512	25,548	40,939	31,209	76.2%	46,358	35,592	2.66%	76.8%
	Guimbal	28,665	21,472	34,769	26,045	74.9%	37,611	28,068	1.51%	74.6%
	Igbaras	26,831	21,499	28,793	23,071	80.1%	29,707	23,432	0.31%	78.9%
	Janiuay	52,720	44,163	59,092	49,501	83.8%	62,277	52,192	1.06%	83.8%
	Lambunao	62,015	57,531	69,790	64,743	92.8%	74,447	69,048	1.30%	92.7%
	Leganes	20,023	13,102	21,849	14,297	65.4%	23,619	15,454	1.57%	65.4%
	Lemery	21,828	19,099	24,100	21,088	87.5%	25,933	22,538	1.34%	86.9%
	Leon	44,497	39,667	53,386	47,591	89.1%	57,049	50,906	1.36%	89.2%
	Maasin	30,069	26,869	31,577	28,216	89.4%	31,803	28,394	0.13%	89.3%
	Miagao	53,506	45,369	56,130	47,594	84.8%	57,416	48,337	0.31%	84.2%
	Mina	17,082	14,763	18,616	16,089	86.4%	20,071	17,228	1.38%	85.8%
	New Lucena	17,139	14,498	17,662	14,941	84.6%	18,644	15,703	1.00%	84.2%
	Oton	60,873	0	71,032	0	0.0%	77,497	0	-	0.0%
	Passi	61,710	53,084	66,660	57,342	86.0%	70,118	60,034	0.92%	85.6%
	Pavia	29,200	20,904	35,577	25,469	71.6%	40,252	28,816	2.50%	71.6%
	Pototan	58,792	42,002	64,521	46,094	71.4%	68,264	48,769	1.13%	71.4%
	San Dionisio	26,554	21,843	29,638	24,380	82.3%	31,677	25,289	0.73%	79.8%
	San Enrique	26,561	24,449	28,825	26,532	92.0%	30,801	28,442	1.40%	92.3%
	San Joaquin	48,057	43,573	57,531	52,163	90.7%	61,229	55,485	1.24%	90.6%
	San Miguel	19,919	6,170	22,598	7,000	31.0%	25,511	7,902	2.45%	31.0%
	San Rafael	12,723	9,579	14,489	10,909	75.3%	16,565	12,850	3.33%	77.6%
	Santa Barbara	41,721	33,801	46,637	37,784	81.0%	51,171	41,965	2.12%	82.0%
	Sara	40,551	36,698	45,062	40,781	90.5%	51,110	46,789	2.79%	91.5%
	Tigbauan	50,061	41,726	57,181	47,660	83.3%	65,257	54,796	2.83%	84.0%
	Tubungan	20,486	19,075	25,989	24,198	93.1%	28,964	26,922	2.16%	93.0%
	Zarraga	19,196	16,062	23,607	19,753	83.7%	27,053	22,829	2.94%	84.4%
	Study Area	1,489,555	1,178,553	1,671,052	1,320,644	79.0%	1,797,841	1,419,598	1.46%	79.0%

8.3.2 School Enrollment Projection

From the 1995 total population of the province, the number of children who would be enrolling in elementary and high school levels for all municipalities is derived.

School age population is extrapolated from the NSO age group classification of 5-9, 10-14 and 15-19 years old bracket by municipality. The age group for the elementary level is from 6 to 13 years, while that for the high school level is from 14 to 17 years. The percentages of school age population for the target years are based on the existing composition or structure of the 1995 population.

From the school age population, the number of children who would attend either private or public school, by target year is computed using the projected participation rate. The participation rate by target year varies depending on the socio-economic condition of the province. Generally, an improved economy will result to a higher participation rate. For the province, an increase in the participation rate in both private and public schools is foreseen by year 2010.

The number of public school students by target year is then derived from the projected number of children who will attend school. A participation rate for public school enrollment is established based on the existing participation rate of public school students to the total school age population. Based on the projection, an increase of 3% from the 1998 rate is foreseen in 2005 and another increase of 5% from the 2005 rate in 2010 (details are referred to Table 8.3.6, Supporting Report).

Table 8.3.2 shows the projected number of public school students by municipality, by target year. About 374,100 and 424,400 public school students are estimated to enroll for years 2005 and 2010, respectively.

8.3.3 Projection of the Number of Public Utilities

The number of public utilities (limited to public markets and bus/jeepney terminals) by target year is projected in urban areas for all municipalities. The provincial physical framework plan and the provincial comprehensive development plan serve as references in the projection. Bus or jeepney terminals are considered in major transport routes of the province.

A hundred fifty-eight (158) public utilities are planned to be constructed by year 2005 and another 210 by year 2010. Refer to Table 8.3.5 for the number of public utilities by municipality by target year (details are referred to Supporting Report).

Table 8.3.5 Projected Public School Enrollment and Number of Public Utilities by Municipality

Name of Municipality/City	Number of Public School Student			Number of Public Utilities		
	1998	2005	2010	1998	2005	2010
Aiuy	9,749	10,566	11,804	2	5	9
Alimodian	5,271	6,451	7,627	3	6	11
Anilao	5,408	6,350	7,020	3	6	9
Badiangan	4,420	5,233	5,739	2	5	8
Balasan	6,065	6,852	7,680	2	5	8
Banate	7,083	8,142	8,938	1	4	8
Barotac Nuevo	7,049	9,126	10,113	2	5	9
Barotac Viejo	8,149	10,018	11,564	3	6	10
Batad	2,707	3,200	3,706	4	7	10
Bingawan	3,008	3,598	3,909	4	7	11
Cabatuan	7,790	8,989	10,046	3	6	11
Calinog	11,029	13,825	15,074	2	5	12
Carles	11,821	15,090	17,592	2	5	11
Concepcion	7,137	8,078	9,455	3	6	10
Dingle	7,493	7,983	8,876	2	5	9
Dueñas	7,209	6,561	5,651	1	4	7
Dumangas	8,569	10,287	13,133	5	8	13
Estancia	8,104	9,959	12,605	2	5	9
Guimbal	6,565	8,098	8,948	6	9	13
Igbaras	6,202	6,851	7,461	4	7	11
Janiuay	11,476	14,873	15,675	6	9	15
Lambunao	13,033	15,092	17,105	5	11	16
Leganes	6,070	5,814	6,159	2	5	10
Lemery	5,292	5,950	6,779	1	4	8
Leon	10,415	12,223	13,787	6	10	16
Maasin	7,241	7,553	8,029	6	9	13
Miagao	11,281	12,460	13,453	3	9	16
Mina	3,768	4,520	5,144	3	5	9
New Lucena	4,780	4,218	4,701	6	9	13
Oton	12,723	15,395	17,784	5	8	14
Passi City	15,663	17,327	18,226	10	14	20
Pavia	6,167	7,692	9,214	2	5	9
Pototan	11,532	13,586	16,171	8	13	20
San Dionisio	7,072	8,332	9,186	4	7	11
San Enrique	5,209	6,036	6,880	1	4	8
San Joaquin	9,571	11,091	12,591	6	10	18
San Miguel	5,332	5,602	6,324	2	5	11
San Rafael	3,588	3,892	4,590	2	5	10
Santa Barbara	7,070	8,658	10,133	6	16	22
Sara	9,107	10,902	13,092	8	13	20
Tigbauan	6,409	9,918	12,984	2	5	10
Tubungan	3,718	5,016	5,590	2	5	14
Zarraga	1,800	2,734	3,830	2	5	10
Provincial Total	319,145	374,141	424,368	154	302	512

8.3.4 Planning Area and its Projected Population for Sewerage

Urban areas with more than 10,000 population provided by Level III water supply systems in 2010 serve as the planning area. Population in the area is considered as the potential population to be served.

Nine (9) municipalities/city with a total urban population of about 108,600 are considered (refer to Table 8.5.4).

8.3.5 Number of Households to be Served by Municipal Solid Waste Collection System

The number of urban households in 2005 is the potential households for the planning (refer to Table 8.3.5, Supporting Report).

8.4 Types of Facilities and Implementation Criteria

In principle, types of facilities and their implementation criteria as prescribed in the NSMP and the NEDA Board Resolution No. 12 (s. 1995) are adopted to this PW4SP.

8.4.1 Water Supply

The following are the major conditions and assumptions applied to urban and rural water supply, which are intended as a guide for the implementation of sector projects.

(1) Urban water supply

Prevailing situation of urban water supply in each municipality was firstly reviewed mainly focusing on existing water sources and magnitude of service coverage. Planned/on-going projects for concerned municipalities were also studied and reflected in the planning, with due attention to merging of municipalities into an integrated water supply system. Potential water source for future development was then evaluated based on the study results in Chapter 7, taking into account the possibility to utilize untapped spring sources. Recommendations arising from these studies were also incorporated as overall development strategy.

Aforementioned studies were carried out by the following sequence:

Review of existing water supply systems and water sources;

Review of planned/on-going projects;

Establishment of planning conditions covering service level, utilization of existing

facilities, water sources, and number of systems; and

Recommendations for overall development strategy.

Table 8.4.1 presents summary of the study results by municipality.

1) Review of existing water supply systems and water sources

The municipalities/city of Ajuy, Alimodian, Amilao, Barotac Nuevo, Cabatuan, Calinog, Dingle, Duenas, Dumangas, Estancia, Janiuay, Leon,Maasin, Miagao, Oton, Passi, Pavia, Pototan, San Miguel and Sta. Barbara are served by WDs. Among them, Cabatuan, Maasin, Oton, Pavia, San Miguel and Sta. Barbara are covered by Metro Iloilo WD (MIWD). Likewise, Barotac Nuevo and Dumangas are covered by Dumangas-Barotac Nuevo WD, and Dingle and Pototan are covered by Dingle-Pototan WD..

While, municipalities of Badiangan, Batad, Guimbal, San Dionisio, San Joaqin and Sara are covered by Level III systems operated by LGUs or local communities.

Population served by existing Level III systems range from about 800 persons at Batad Rural WW to 32,000 persons (for 6 municipalities excluding Iloilo City) at MIWD. The average size of served population is about 14,400/system. These existing Level III systems in urban area are utilizing various kinds of water sources such as deep well/dug well/spring/surface water.

The remaining 15 municipalities, out of the total 43 municipalities/city, have no Level III system in their urban areas and are presently served by Level II systems and/or Level I facilities.

2) Review of planned/on-going projects

At present, Metro Iloilo Water District has an expansion plan to meet future needs in the service area applying BOT scheme. WDs in Ajuy, Anilao and Passi City have plans of expansion/water source augmentation. Miagao WD is undertaking expansion of pipelines. Lemery and Tubungan have plans of new Level III system.

3) Establishment of planning conditions

a. Service level

It shall be noted that a national policy for urban water supply is a Level III system, as the most suitable measure. Therefore, for the investment needs of the sector development, it is assumed in this PW4SP that underserved or unserved urban population at present and in the future will be provided with individual

Table 8.4.1 Summary of Urban Water Supply Development by Municipality/City

Municipality	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Ajuy	There exists one WD which utilizes spring source. Rehabilitation/improvement of existing facility is required.	Proposed spring source improvement	DW; low yield (ironic problem) SP; scattered & limited yield (potable) Future development; grouped springs	Expanxion of the existing system with the augmentation of spring sources by providing filtration basin.
Alimodian	There exists one WD which utilizes deep well source.		DW; high yield (acidic & ironic problems locally) SP; a few springs in the hilly area Future development; DW	Expanxion of the existing system with the augmentation of deep well sources; Merging into MIWD may be studied.
Anilao	One WD is under operation using deep well source.	Expansion of distribution pipeline (Poblacion - Barangay)	DW; high yield (salinity in coastal area & ironic problem locally) SP; a few springs in the hilly area Future development; select thr. cost comparison among DW, SP and the combination of the two	Expansion of existing system using either spring or well sources.
Badiangan	There is one WWs which utilizes spring source.		DW; high yield (acidic & chloride problems) SP; few spring in the hilly area Future development; SP	Expansion of existing system using spring sources.
Balasan	There exist no Level III systems.		DW; low yield (ironic problem locally) SP; scattered &limited yield (potable) Future development; grouped springs	A new system is necessary in use of spring sources.
Banate	There exist no Level III systems.		DW; high yield (salinity in the coast area) SP; scatter & small (potable) Future development; DW	A new system is necessary in use of deep well sources with a due consideration to salt water intrusion.
Barotac Nuevo	There exists one WD, which utilizes deep well sources.		DW; high yield (salinity in the coast area) SP; a few springs in the hilly area Future development; DW	Expansion of the existing system using deep wells. A due consideration shall be made on prevalent salt water intrusion problem.
Barotac Viejo	There exists one WD, which utilizes deep well sources.		DW; high yield (ironic) SP; scattered & limited yield (potable) Future development; DW	Expansion of the existing system using deep wells.
Batad	There exists one WWs. which utilizes deep well sources.		DW; low yield (slightly ironic problem) SP; scattered & limited yield (potable) Future development; DW	Expansion of the existing system using deep wells.

house connections. However, it does not intend in the future to exclude, as individual cases, Level I and II facilities from being implemented in urban area.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality/City (Cont'd)

Municipality	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Bingawan	There exist no Level III systems.		DW; low yield (acidic & high Ca problems) SP; scattered & limited yield (potable) Future development; SP or infiltration gallery	A new system is necessary using springs/ infiltration gallery
Cabatuan	MIWD extends services to this area.		DW; high yield (acidic & ironic problems) SP; a few springs in the hilly area Future development; MIWD	Expansion of the system under MIWD using surface water
Calinog	There exists one WD, which utilizes deep well sources.		DW; high yield (acidic & ironic problems) SP; a few springs in the hilly area Future development; DW	Expansion of the existing system using deep wells.
Carles	There exist no Level III systems.		DW; low yield (slightly ironic) SP; scattered & limited yield (potable) Future development; SP	A new system is necessary using springs
Concepcion	There exists one WD, which utilizes spring sources.		DW; low yield (slightly ironic problem) SP; scattered & limited yield (potable) Future development; SP	Expansion of the existing system using spring source
Dingle	There exists one WD, which utilizes spring and deep well sources.		DW; high yield (high Fe problem) SP; some SPs in Limestone hill (potable) Future development; SP	Expansion of the existing system using spring source
Dueñas	There exists one WD at barangay Capuling, utilizing deep well sources.		DW; high yield (high Fe & acidic problems) SP; a few springs in the hilly area (potable) Future development; DW	Expansion of the existing system using deep wells. Elevated water tank shall be constructed. A due consideration shall be made on prevalent salt water intrusion problem.
Dumangas	There exists one WD, which utilizes deep well sources.		DW; high yield (high Fe & slainity in the coastal area) SP; none Future development; DW	Expansion of the existing system using deep wells.
Estancia	There exists one WD, which utilizes deep well sources.		DW; low yield (slightly ironic problem) SP; scattered & limited yield (potable) Future development; DW	Expansion of the existing system using deep wells.
Guimbal	There exists one WWs, which utilizes deep well sources.		DW; high yield (salinity in the coastal area) SP; far from populated area (potable) Future development; DW	Expansion of the existing system using deep wells. Rehabilitation of generator ia necessary to back up operatation in cuse of brown out.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality/City (Cont'd)

Municipality	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Igbaras	There exist no Level III systems.		DW; high yield (potable) SP; scattered & far from populated area (potable) Future development; DW & SP	A new system is necessary using springs/deep wells
Janiuay	There exists one WD, which utilizes deep well sources.		DW; sufficient yild (acidic & chlorude problems) SP; scattered & far from populated area (potable) Future development; SP	Expansion of the existing system using spring source to connect five barangays.
Lambunao	There exist no Level III systems.	DW construction w/water tank	-ditto-	A new system is necessary using springs or deep well using series of pumps.
Leganes	There exist no Level III systems.		DW; high yield (salinity in the coastal area & ironic/acidic problems) SP; none Future development; DW or merge into MIWD	A new system is necessary using deep wells; Merging into MIWD may be studied.
Lemery	There exist no Level III systems.	Planned Level III thru LWUA	DW; low yield (high Fe problem) SP; scattered & limited yield (potable) Future development; SP	A new system is necessary using springs
Leon	There are one each of WD and WWs, both of which utilize deep well sources.		DW; high yield (potable) SP; scattered, limited yield & far from populated area (potable) Future development; DW	Expansion of the existing system using deep wells.
Maasin	The area is served by MIWD.		DW; high yield (acidic & chloride problems) SP; scattered, limited yield & far from populated area (potable) Future development; under MIWD	Expansion of the existing system under MIWD
Miagao	There exists one WD, which utilizes spring sources.	On-going (expansion of pipelines)	DW; high yield (slainity in the coastal area) SP; scattered & limited yield (potable) Future development; DW or SP	Expansion of the existing system using deep wells/springs.
Mina	There exists non-operational Level III system.		DW; high yield (high Fe & acidic problems) SP; none Future development; DW	Rehabilitation together with expansion of the existing system is necessary to service the whole urban area and
New Lucena	There exists one WWs, which utilizes deep well sources.		-ditto-	Expansion of the existing system using deep wells

Table 8.4.1 Summary of Urban Water Supply Development by Municipality/City (Cont'd)

Municipality	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Oton	The area is served by MIWD.		DW; high yield with decline groundwater (salinity in the coast), SP; none Future development; MIWD	Expansion of the existing system under MIWD
Passi City	There exists one WD, which utilizes spring and deep well sources.		DW; low yield (high Ca & Fe problems) SP; scattered & limited yield (potable) Future development; SP or Infiltration gallery	Expansion of the existing system using springs or infiltration gallery
Pavia	The area (13 brgys) is served by MIWD.		DW; high yield, but declining of groundwater level (acidic & ironic problems) SP; none Future development; SP	Expansion of the existing system under MIWD
Pototan	There exists one WD, which utilizes deep well sources.		DW; high yield (high Fe & acidic problem) SP; scattered, limited yield & far from populated area (potable) Future development; DW	Expansion of the existing system using deep wells.
San Dionisio	There exists one WWs, which utilizes spring sources.		DW; low yield (slightly ironic problem) SP; scattered & limited yield (potable) Future development; DW	Expansion of the existing system using deep wells.
San Enrique	There exist no Level III systems.		DW; normal yield (acidic & ironic problems) SP; scattered (potable) Future development; SP	A new system is necessary using spring sources.
San Joaquin	There exists one WWs, which utilizes spring sources.		DW; normal yield (salinity in the coastal area) SP; scattered & limited yield (potable) Future development; SP	Expansion of the existing system using spring source
San Miguel	Only one bragy (San Jose) is served by MIWD. But Poblacion is not covered by Level III system at present.		DW; high yield, but declining of groundwater level (slightly acidic & ironic problems) SP; none Future development; MIWD	Expansion of the existing system under MIWD
San Rafael	There exist no Level III systems.		DW; low yield (high Fe problem) SP; scattered & limited yield (potable) Future development; SP or DW	A new system is necessary using spring/deep well sources.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality/City (Cont'd)

Municipality	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Santa Barbara	The area is served by MIWD.		DW; high yield (slightly acidic & ironic problems) SP; scattered & limited yield (potable) Future development; MIWD	Expansion of the existing system under MIWD
Sara	There exists one WWs, which utilizes spring sources.		DW; low yield (high Fe problem) SP; scattered & limited yield (potable) Future development; SP	Expansion of the existing system using spring source
Tigbauan	There exist no Level III systems.		DW; normal yield (potable) SP; scattered & limited yield (potable) Future development; DW	A new system is necessary using deep wells.
Tubungan	There exist no Level III systems.	Proposed Level III system	-ditto-	A new system is necessary using deep wells.
Zarraga	There exist no Level III systems.		DW; high yield (high Fe problem) SP; none Future development; DW	A new system is necessary using deep wells.

b. Utilization of existing facilities

The existing Level I and II facilities are considered to be utilized during the Phase I period. However, the population served by these facilities is to be absorbed by Level III service in Phase II.

c. Water sources

Possibility/availability to utilize surface water and groundwater (spring and deep well) is evaluated as potential water sources for water supply development.

From the viewpoints of cost effectiveness and easy O&M of water supply system, utilization of spring sources is given due priority in the course of urban water supply planning. Application of deep wells for water source is regarded as the second priority in principle. Surface water is, on the other hand, not adopted at this moment, because of large capital investment requirements and complexity of surface water treatment.

d. Number of systems

In principle, one (1) Level III system is considered for urban area of every municipality. In the municipalities with an existing Level III system/s, the expansion of the system was first considered. In case of no existence of Level III system/s, a new system was recommended. Existing plan/s on the development of Level III/WD are also taken into account to determine the respective systems of the municipalities.

Possibility and necessity to merge service area of some neighboring municipalities to an urban water supply system were also studied from the viewpoint of:

water source constraints, and

economical development/scale merit of water supply system by cost reduction of water source development and other common facilities as well as O&M cost/minimized number of technical staff.

Any rural barangay/s being served by an existing urban Level III system are considered to continue throughout the future.

e. Rehabilitation

Rehabilitation of existing and future facilities is assumed to be undertaken by the operating bodies.

4) Overall development strategy

Expansion of the existing system/s was planned for those with WD/Level III, while creation of the system is considered for those without systems at present.

Merging of municipal systems (physical arrangement) in the long-term is considered. Integrated management systems shall also be sought. Conditions to be studied include; water source availability, willingness by concerned municipalities and technical study on cost recovery/economic construction.

The following WD/municipalities may be studied for the integration both in physical and management systems.

- Metro Iloilo WD, Alimodian and Leganes

Integration of small Level III systems for operation and management shall be sought, although these systems are currently managed individually.

Some municipalities have high potential for spring development due to the presence of a number of untapped spring sources favorable for urban water supply that were identified during the course of PW4SP preparation. However, a detailed survey to ensure appropriate development of spring sources shall be conducted in the implementation of the projects.

(2) Rural water supply

1) Service level

Level I systems (deep well/shallow well/developed spring) are generally planned for rural areas where houses are scattered. In the PW4SP, public investment for Level I facilities covers 50% of the total number of required facilities, considering the existing share between public (39%) and private facilities (61%).

Level II systems are considered where houses are clustered and suitable untapped spring is available.

Service level standards are set forth as 15 households per source for Level I and 5 households per communal faucet for Level II, as defined in the national plan.

Application of Level III systems in rural areas may be considered in a case to case basis during actual implementation.

2) Utilization of existing facilities

The existing facilities/systems in all service levels are considered to be utilized throughout the future.

3) Water source

For Level I facilities, deep well construction is given priority wherever applicable considering safety against possible contamination and stable water supply. Standard specifications of shallow and deep wells are summarized in Table 8.4.2 based on the water source evaluation results presented in Chapter 7. Conventional construction method (driven well) may be employed under favorable substrata or hydrogeological conditions. The standard structure of wells in application of "open-hole drilling and gravel pack" is presented in Figure 8.4.1, Supporting Report. In addition to this, for deep well with high iron content, application of iron removal facility is recommended. The standard structure of iron removal facility is presented in Figures 8.4.2 (a) and 8.4.2 (b), Supporting Report.

Spring development is also included in Level I planning by adopting its share of 10% referring to study results of water source development presented in Chapter 7.

For Level II systems, a total of 20 untapped springs suitable for water supply purpose are considered. Identified untapped springs are presented in Table 7.4.1, Supporting Report.

Table 8.4.2 Standard Specifications of Level I Wells

Specification	Shallow Well	Deep Well
Construction Method	Open-hole drilling and gravel pack	
Casing Diameter	50mm	100mm
Borehole Diameter	150mm	200mm
Ranges of Well Depth	Standard Depth	
0 - 20m	20m	Not Applicable
21 - 50m	Not Applicable	40m
51 - 100m	Not Applicable	80m
101 - 150m	Not Applicable	120m

Profile between gravel packed well and natural gravel packed well for Level I water supply:

The open-hole drilling method is employed for the well construction to ensure yield of ground water from adequate aquifer in provision of proper screen location and specifications. The conventional "cased-hole driven well" shall be used only in cases

where well specifications are established in the specified area with sufficient information on the hydrogeological condition including existence of natural gravel at the expected aquifer.

It is important to study the potential areas to adopt natural gravel method, which can perform the same level of function as gravel-packed wells. Such areas are usually limited to the upper stream of larger rivers in alluvial fans and alluvial plains. The arial proportion between those in application of gravel-packed and natural gravel pack wells will be worked out the referring to the condition of the province.

Modification needs of riser pipe diameter according to the water level of deep wells:
The standard specification of riser pipe of deep well hand pump is set with a diameter of 2-1/2 inch in the plan. However, water level of the deep wells may range between 20m and around 40m, depending on the aquifer conditions.

Although the Malawi type deep well pump with a cylinder that is currently used in the Philippines has operation experience up to 40 m in pumping water level, the diameter of riser pipe must be adjusted between 1" to 2-1/2" in order to lower required power at the pump handle (calculating required power under the specific pumping water level).

For Level II systems, only untapped springs suitable for water supply purpose are considered. Identified untapped springs are presented in Table 7.4.1, Supporting Report.

4) Number of systems/facilities
The number of Level I wells and spring development is estimated based on the service level standard; while the number of Level II systems coincides with the number of untapped springs having an estimated discharge of 0.5 lps. or more.

5) Rehabilitation
Rehabilitation of existing Level I wells is not considered, since most of the wells constructed by driving method is not suitable for rehabilitation to recover their functions. However, minor repair work for hand-pump and concrete apron is a requisite.

8.4.2 Sanitation

The conditions and assumptions are established for the different sanitation components to serve as guides in the implementation of projects.

(1) Household toilets

Three types of sanitary toilet facilities for individual houses are considered for Phase I: flush, pour-flush and VIP/sanitary pit privy (dry-type). While for Phase II, flush and pour-flush are planned considering the improvement of living standard.

The type of toilet facilities is dependent on the existing or planned service level of water supply in the community. In urban and rural areas with Level I or II water supply facilities, only pour-flush and/or VIP are considered, while in urban areas with Level III water supply systems, flush type toilets requiring a piped water connection are included. Isolated rural areas where there is dearth of water supply, sanitary pit privy (dry type) is taken into account.

(2) School toilets

Standard service level currently used by DECS (40 students per unit facility) is employed for both phases.

The standard toilet facility (1 building) with 5 units of toilet bowl to serve for 200 students is adopted for the planning purpose, which is modified from FW4SP design to provide a shallow well as a water source. Since DECS is currently promoting the "one classroom-one toilet" concept, the PW4SP also adopts this concept on a 50-50 basis, that is 50% of the school toilet requirements will be allocated using the JICA-RESP design and the other 50% will be adopting the new concept.

(3) Public toilets

As a minimum requirement, at least 1 sanitary toilet facility is assumed to be provided for respective utilities: public market bus/jeepney terminal and parks/playground.

The DOH standard design with 6-units of toilet bowl for the market is adopted. In this design, it is assumed that water supply will be tapped from the existing system, hence an elevated water tank is provided.

8.4.3 Urban Sewerage

The commencement of staged implementation of the sewerage program is planned in Phase II for the limited urban area (50% of urban population served by Level III system for the municipalities with urban population of more than 10,000). It is practical to start the program fully using the existing facilities to allow for lower initial investment cost than starting at once a conventional sewerage system (refer to Figure 8.4.2 Staged Improvement in Sewage Collection Method, Supporting Report).

Low cost off-site technologies such as small-bore sewer for collection of effluent from septic tank are to be adopted. Improvement of sewage collection method may be gradually achieved from combined sewer to separate sewerage system.

Sewage treatment facilities may range from community scale septic tank or Imhoff tank to aerated lagoon systems and to a more advanced treatment process such as oxidation ditch. For this PW4SP, aerated lagoons are assumed as a representative treatment facility for planning purpose. Daily average wastewater quantity is assumed at 100 liters per capita per day.

8.4.4 Solid Waste

In terms of facility requirements, this PW4SP only studied the number of refuse collection trucks required for the year 2005. A rated capacity of 5 cu.m truck/vehicle is considered for calculation of required units of truck. Disposal of solid waste shall be studied in detail through investigations, F/S and D/D. Unit solid waste generation for urban area is assumed to be 0.418 kg. per capita per day.

8.5 Service Coverage by Target Year

8.5.1 Water Supply

The service coverage in terms of population to be served by target year was estimated by urban and rural area by municipality. The service coverage in rural area was further subdivided by service level (Level I & Level II) to finally come up with physical requirements.

Base figures applied to estimate the future service coverage and the additional population to be served are:

provincial sector targets;

population projection by target year; and

base year service coverage (served population) by existing facilities.

Future requirements in terms of additional population to be served were then estimated by urban (Level III) and rural (Level I & II) area by municipality as a shortfall to meet the population to be served in each target year. The population served in base year is adopted as the population served in target year, when the former population exceeds the population to be served in the target year/s. Manner of calculation is specifically presented by phase.

(1) Phase I requirements

Additional service coverage was estimated as a shortfall of the population to be served in Phase I comparing with the population served in base year. In this connection, existing facilities both in urban and rural areas are assumed to be utilized during the Phase I period.

The utilization of untapped springs for Level II systems was given priority during Phase I period for rural water supply. At the time of this plan preparation, 20 untapped springs in 5 municipalities were identified.

(2) Phase II requirements

Additional service coverage was estimated as a shortfall of the population to be served in Phase II comparing with the population served in Phase I. In this regard, existing facilities in rural area were assumed to be utilized through the two Phases, while urban population served by Level I and II facilities in base year was assumed to be absorbed by Level III service during Phase II period.

Table 8.5.1 presents the service coverage by target year and by level of service as well as the additional population to be served (details are referred to Supporting Report).

Through Phase I development, approximately 158,700 persons in the province will be served by additional water supply services, of which 31,400 persons or 20% of the total will be urban population and 127,300 persons or 80% will be rural population.

For Phase II period, a total of 725,700 persons, of which 263,900 persons or 36% in urban area and 461,800 persons or 64% in rural area, will be further benefited by water supply services. This additional service coverage in urban area includes the upgrade of service level for 429,900 persons served by Level I and II facilities in 1998.

Table 8.5.1 Population to be Served by Target Year (Water Supply)

Name of Municipality/City	Area	Phase I Coverage (2005)									Phase II Coverage (2010)								
		Total Population	Service Coverage				Additional Population to be Served				Total Population	Service Coverage				Additional Population to be Served			
			Level III	Level II	Level I	Total	Level III	Level II	Level I	Total		Level III	Level II	Level I	Total	Level III	Level II	Level I	Total
Ajuy	Urban	3,247	2,890			2,890					3,491	3,316			3,316	426			426
	Rural	37,776	4,490	2,300	17,788	24,578					39,926	4,490	2,300	30,341	37,131			12,553	12,553
	Total	41,023	7,380	2,300	17,788	27,468					43,417	7,806	2,300	30,341	40,447	426		12,553	12,979
Alimodian	Urban	7,726	4,249		1,926	6,175	1,009			1,009	8,190	7,781			7,781	3,532			3,532
	Rural	27,565		5,751	14,068	19,819		3,576		3,576	29,259		5,751	21,460	27,211			7,392	7,392
	Total	35,291	4,249	5,751	15,994	25,994	1,009	3,576		4,585	37,449	7,781	5,751	21,460	34,992	3,532		7,392	10,924
Anilao	Urban	2,024	1,368		152	1,520	264			264	2,220	2,109			2,109	741			741
	Rural	22,400	330		11,177	11,507			2,906	2,906	23,956	330		21,949	22,279			10,772	10,772
	Total	24,424	1,698		11,329	13,027	264		2,906	3,170	26,176	2,439		21,949	24,388	741		10,772	11,513
Badiangan	Urban	1,826	490		991	1,481					2,015	1,914			1,914	1,424			1,424
	Rural	23,929		250	20,771	21,021					24,663		250	22,687	22,937			1,916	1,916
	Total	25,755	490	250	21,762	22,502					26,678	1,914	250	22,687	24,851	1,424		1,916	3,340
Balasan	Urban	3,946	515		2,512	3,027	515			515	3,972	3,773			3,773	3,258			3,258
	Rural	22,272			17,079	17,079			2,889	2,889	23,869			22,198	22,198			5,119	5,119
	Total	26,218	515		19,591	20,106	515		2,889	3,404	27,841	3,773		22,198	25,971	3,258		5,119	8,377
Banate	Urban	1,721			1,214	1,214					1,807	1,717			1,717	1,717			1,717
	Rural	28,283			18,057	18,057			3,669	3,669	31,130			28,951	28,951			10,894	10,894
	Total	30,004			19,271	19,271			3,669	3,669	32,937	1,717		28,951	30,668	1,717		10,894	12,611
Barotac Nuevo	Urban	4,151	2,010		1,727	3,737					4,151	3,943			3,943	1,933			1,933
	Rural	41,682	4,210		33,544	37,754					43,463	4,210		36,211	40,421			2,667	2,667
	Total	45,833	6,220		35,271	41,491					47,614	8,153		36,211	44,364	1,933		2,667	4,600
Barotac Viejo	Urban	4,442	580		2,026	2,606	580			580	4,795	4,555			4,555	3,975			3,975
	Rural	35,535	2,880	1,575	20,277	24,732			4,610	4,610	38,925	2,880	1,575	31,745	36,200			11,468	11,468
	Total	39,977	3,460	1,575	22,303	27,338	580		4,610	5,190	43,720	7,435	1,575	31,745	40,755	3,975		11,468	15,443
Batad	Urban	1,328	780	75	74	929					1,367	1,299			1,299	519			519
	Rural	17,171		1,625	10,477	12,102			2,228	2,228	18,404		1,625	15,491	17,116			5,014	5,014
	Total	18,499	780	1,700	10,551	13,031			2,228	2,228	19,771	1,299	1,625	15,491	18,415	519		5,014	5,533
Bingawan	Urban	3,752			3,094	3,094					4,123	3,917			3,917	3,917			3,917
	Rural	9,758			4,275	4,275			1,266	1,266	10,106			9,399	9,399			5,124	5,124
	Total	13,510			7,369	7,369			1,266	1,266	14,229	3,917		9,399	13,316	3,917		5,124	9,041
Cabatuan	Urban	47,489	8,690	375	29,974	39,039	6,200			6,200	49,757	47,269			47,269	38,579			38,579
	Rural																		
	Total	47,489	8,690	375	29,974	39,039	6,200			6,200	49,757	47,269			47,269	38,579			38,579
Calinog	Urban	5,967	2,543		1,202	3,745	779			779	6,469	6,146			6,146	3,603			3,603
	Rural	52,468	150		20,176	20,326			6,806	6,806	57,243	150		53,086	53,236			32,910	32,910
	Total	58,435	2,693		21,378	24,071	779		6,806	7,585	63,712	6,296		53,086	59,382	3,603		32,910	36,513
Carles	Urban	2,717	355		909	1,264	355			355	2,921	2,775			2,775	2,420			2,420
	Rural	54,338		4,565	16,621	21,186		2,140	4,909	7,049	60,091		4,565	51,320	55,885			34,699	34,699
	Total	57,055	355	4,565	17,530	22,450	355	2,140	4,909	7,404	63,012	2,775	4,565	51,320	58,660	2,420		34,699	37,119
Concepcion	Urban	5,010	654		2,154	2,808	654			654	5,999	5,699			5,699	5,045			5,045
	Rural	30,694		185	16,540	16,725			3,982	3,982	33,338		185	30,819	31,004			14,279	14,279
	Total	35,704	654	185	18,694	19,533	654		3,982	4,636	39,337	5,699	185	30,819	36,703	5,045		14,279	19,324
Dingle	Urban	6,171	1,960		2,770	4,730					6,457	6,154			6,154	4,174			4,174
	Rural	31,778	6,758	1,400	18,737	26,895					33,253	6,758	1,400	22,767	30,925			4,030	4,030
	Total	37,949	8,718	1,400	21,507	31,625					39,710	12,892	1,400	22,767	37,059	4,174		4,030	8,204
Duenas	Urban	5,280	1,950		2,128	4,078					5,844	5,552			5,552	3,602			3,602
	Rural	26,268			20,120	20,120			3,408	3,408	27,050			25,157	25,157			5,037	5,037
	Total	31,548	1,950		22,248	24,198			3,408	3,408	32,894	5,552		25,157	30,709	3,602		5,037	8,639

Table 8.5.1 Population to be Served by Target Year (Water Supply) (cont'd)

Name of Municipality/City	Area	Phase I Coverage (2005)									Phase II Coverage (2010)								
		Total Population	Service Coverage				Additional Population to be Served				Total Population	Service Coverage				Additional Population to be Served			
			Level III	Level II	Level I	Total	Level III	Level II	Level I	Total		Level III	Level II	Level I	Total	Level III	Level II	Level I	Total
Dumangas	Urban	2,013	1,428		184	1,612	263			263	2,038	1,936			1,936	508			508
	Rural	54,277	6,215	175	23,505	29,895			7,041	7,041	57,143	6,215	175	46,753	53,143			23,248	23,248
	Total	56,290	7,643	175	23,689	31,507	263		7,041	7,304	59,181	8,151	175	46,753	55,079	508		23,248	23,756
Estancia	Urban	9,730	4,540		2,616	7,156	1,270			1,270	10,766	10,228			10,228	5,688			5,688
	Rural	31,209			16,745	16,745			4,049	4,049	35,592			33,101	33,101			16,356	16,356
	Total	40,939	4,540		19,361	23,901	1,270		4,049	5,319	46,358	10,228		33,101	43,329	5,688		16,356	22,044
Guimbal	Urban	8,724	3,708		2,399	6,107					9,543	9,066			9,066	5,358			5,358
	Rural	26,045		275	17,068	17,343			3,379	3,379	28,068		275	25,828	26,103			8,760	8,760
	Total	34,769	3,708	275	19,467	23,450			3,379	3,379	37,611	9,066	275	25,828	35,169	5,358		8,760	14,118
Igbaras	Urban	5,722	747		3,165	3,912	747			747	6,275	5,961			5,961	5,214			5,214
	Rural	23,071		950	13,155	14,105			2,993	2,993	23,432		950	20,842	21,792			7,687	7,687
	Total	28,793	747	950	16,320	18,017	747		2,993	3,740	29,707	5,961	950	20,842	27,753	5,214		7,687	12,901
Janiuay	Urban	9,591	3,658		3,926	7,584	1,252			1,252	10,086	9,582			9,582	5,924			5,924
	Rural	49,501	168		33,317	33,485			6,421	6,421	52,191	168		48,370	48,538			15,053	15,053
	Total	59,092	3,826		37,243	41,069	1,252		6,421	7,673	62,277	9,750		48,370	58,120	5,924		15,053	20,977
Lambunao	Urban	5,046	659		1,261	1,920	659			659	5,398	5,128			5,128	4,469			4,469
	Rural	64,744			32,592	32,592			8,399	8,399	69,049			64,216	64,216			31,624	31,624
	Total	69,790	659		33,853	34,512	659		8,399	9,058	74,447	5,128		64,216	69,344	4,469		31,624	36,093
Leganes	Urban	7,553	1,286		3,660	4,946	986			986	8,164	7,756			7,756	6,470			6,470
	Rural	14,296	150	2,530	8,149	10,829		1,855		1,855	15,455	150	2,530	11,693	14,373			3,544	3,544
	Total	21,849	1,436	2,530	11,809	15,775	986	1,855		2,841	23,619	7,906	2,530	11,693	22,129	6,470		3,544	10,014
Lemery	Urban	3,013			2,168	2,168					3,396	3,226			3,226	3,226			3,226
	Rural	21,087		200	14,667	14,867					22,537		200	20,759	20,959			6,092	6,092
	Total	24,100		200	16,835	17,035					25,933	3,226	200	20,759	24,185	3,226		6,092	9,318
Leon	Urban	5,795	2,515		1,808	4,323	757			757	6,143	5,836			5,836	3,321			3,321
	Rural	47,591	1,350	1,350	29,948	32,648			6,174	6,174	50,906	1,350	1,350	44,643	47,343			14,695	14,695
	Total	53,386	3,865	1,350	31,756	36,971	757		6,174	6,931	57,049	7,186	1,350	44,643	53,179	3,321		14,695	18,016
Maasin	Urban	3,360	1,024		1,596	2,620	439			439	3,408	3,238			3,238	2,214			2,214
	Rural	28,217	730	25	18,896	19,651			3,660	3,660	28,395	730	25	25,652	26,407			6,756	6,756
	Total	31,577	1,754	25	20,492	22,271	439		3,660	4,099	31,803	3,968	25	25,652	29,645	2,214		6,756	8,970
Miagao	Urban	8,536	3,226		2,597	5,823	1,114			1,114	9,079	8,625			8,625	5,399			5,399
	Rural	47,594		875	32,000	32,875			6,174	6,174	48,337		875	44,078	44,953			12,078	12,078
	Total	56,130	3,226	875	34,597	38,698	1,114		6,174	7,288	57,416	8,625	875	44,078	53,578	5,399		12,078	17,477
Mina	Urban	2,527	330		1,404	1,734	330			330	2,843	2,701			2,701	2,371			2,371
	Rural	16,089			10,692	10,692			2,087	2,087	17,228			16,022	16,022			5,330	5,330
	Total	18,616	330		12,096	12,426	330		2,087	2,417	20,071	2,701		16,022	18,723	2,371		5,330	7,701
New Lucena	Urban	2,722	355		1,678	2,033	355			355	2,941	2,794			2,794	2,439			2,439
	Rural	14,940	270		9,984	10,254					15,703	270		14,334	14,604			4,350	4,350
	Total	17,662	625		11,662	12,287	355			355	18,644	3,064		14,334	17,398	2,439		4,350	6,789
Oton	Urban	71,032	11,898		21,787	33,685	9,273			9,273	77,497	73,622			73,622	61,724			61,724
	Rural																		
	Total	71,032	11,898		21,787	33,685	9,273			9,273	77,497	73,622			73,622	61,724			61,724

Table 8.5.1 Population to be Served by Target Year (Water Supply) (cont'd)

Name of Municipality/City	Area	Phase I Coverage (2005)									Phase II Coverage (2010)								
		Total Population	Service Coverage				Additional Population to be Served				Total Population	Service Coverage				Additional Population to be Served			
			Level III	Level II	Level I	Total	Level III	Level II	Level I	Total		Level III	Level II	Level I	Total	Level III	Level II	Level I	Total
Passi City	Urban	9,317	8,550	75		8,625					10,084	9,580			9,580	1,030			1,030
	Rural	57,343	2,466	125	37,129	39,720					60,034	2,466	125	53,241	55,832			16,112	16,112
	Total	66,660	11,016	200	37,129	48,345					70,118	12,046	125	53,241	65,412	1,030		16,112	17,142
Pavia	Urban	10,108	5,845		1,957	7,802					11,437	10,865			10,865	5,020			5,020
	Rural	25,469	7,964	1,025	9,626	18,615					28,815	7,964	1,025	17,809	26,798			8,183	8,183
	Total	35,577	13,809	1,025	11,583	26,417					40,252	18,829	1,025	17,809	37,663	5,020		8,183	13,203
Pototan	Urban	18,426	6,360		7,916	14,276					19,495	18,520			18,520	12,160			12,160
	Rural	46,095	435	100	33,948	34,483			5,980	5,980	48,769	435	100	44,820	45,355			10,872	10,872
	Total	64,521	6,795	100	41,864	48,759			5,980	5,980	68,264	18,955	100	44,820	63,875	12,160		10,872	23,032
San Dionisio	Urban	5,258	3,440		767	4,207	686			686	6,389	6,070			6,070	2,630			2,630
	Rural	24,380		2,448	11,893	14,341		523	2,640	3,163	25,288		2,448	21,070	23,518			9,177	9,177
	Total	29,638	3,440	2,448	12,660	18,548	686	523	2,640	3,849	31,677	6,070	2,448	21,070	29,588	2,630		9,177	11,807
San Enrique	Urban	2,292	299		1,243	1,542	299			299	2,360	2,242			2,242	1,943			1,943
	Rural	26,533			17,360	17,360			3,442	3,442	28,441			26,450	26,450			9,090	9,090
	Total	28,825	299		18,603	18,902	299		3,442	3,741	30,801	2,242		26,450	28,692	1,943		9,090	11,033
San Joaquin	Urban	5,368	2,004		1,960	3,964	701			701	5,745	5,458			5,458	3,454			3,454
	Rural	52,163	2,422	7,825	19,459	29,706		1,130	5,637	6,767	55,484	2,422	7,825	41,353	51,600			21,894	21,894
	Total	57,531	4,426	7,825	21,419	33,670	701	1,130	5,637	7,468	61,229	7,880	7,825	41,353	57,058	3,454		21,894	25,348
San Miguel	Urban	15,599	815		12,753	13,568					17,609	16,729			16,729	15,914			15,914
	Rural	6,999		425	5,661	6,086					7,902		425	6,924	7,349			1,263	1,263
	Total	22,598	815	425	18,414	19,654					25,511	16,729	425	6,924	24,078	15,914		1,263	17,177
San Rafael	Urban	3,580			2,782	2,782					3,715	3,529			3,529	3,529			3,529
	Rural	10,909			8,404	8,404			1,415	1,415	12,850			11,951	11,951			3,547	3,547
	Total	14,489			11,186	11,186			1,415	1,415	16,565	3,529		11,951	15,480	3,529		3,547	7,076
Santa Barbara	Urban	8,853	1,130		5,240	6,370					9,206	8,746			8,746	7,616			7,616
	Rural	37,784	1,315	150	26,017	27,482					41,965	1,315	150	37,562	39,027			11,545	11,545
	Total	46,637	2,445	150	31,257	33,852					51,171	10,061	150	37,562	47,773	7,616		11,545	19,161
Sara	Urban	4,281	582		2,792	3,374					4,321	4,105			4,105	3,523			3,523
	Rural	40,781	434	1,400	33,213	35,047					46,789	434	1,400	41,680	43,514			8,467	8,467
	Total	45,062	1,016	1,400	36,005	38,421					51,110	4,539	1,400	41,680	47,619	3,523		8,467	11,990
Tigbauan	Urban	9,521	1,243		5,618	6,861	1,243			1,243	10,461	9,938			9,938	8,695			8,695
	Rural	47,660		1,625	22,799	24,424			6,183	6,183	54,796		1,625	49,335	50,960			26,536	26,536
	Total	57,181	1,243	1,625	28,417	31,285	1,243		6,183	7,426	65,257	9,938	1,625	49,335	60,898	8,695		26,536	35,231
Tubungan	Urban	1,790	234	125	1,001	1,360	234			234	2,042	1,940			1,940	1,706			1,706
	Rural	24,199		1,300	16,120	17,420			3,139	3,139	26,922		1,300	23,737	25,037			7,617	7,617
	Total	25,989	234	1,425	17,121	18,780	234		3,139	3,373	28,964	1,940	1,300	23,737	26,977	1,706		7,617	9,323
Zarraga	Urban	3,854	503		2,093	2,596	503			503	4,224	4,013			4,013	3,510			3,510
	Rural	19,753			13,177	13,177			2,562	2,562	22,829			21,231	21,231			8,054	8,054
	Total	23,607	503		15,270	15,773	503		2,562	3,065	27,053	4,013		21,231	25,244	3,510		8,054	11,564
Provincial Total	Urban	350,408	95,413	650	149,224	245,287	31,467			31,467	378,243	359,333			359,333	263,920			263,920
	Rural	1,320,646	42,737	40,454	775,231	858,422		9,224	118,048	127,272	1,419,596	42,737	40,454	1,237,035	1,320,226			461,804	461,804
	Total	1,671,054	138,150	41,104	924,455	1,103,709	31,467	9,224	118,048	158,739	1,797,839	402,070	40,454	1,237,035	1,679,559	263,920		461,804	725,724

8.5.2 Sanitation

(1) Household toilets

The service coverage (number of households to be served) by different types of sanitary facility is estimated by urban and rural area by municipality for the years 2005 and 2010. The future service coverage and additional households to be served are estimated to meet the provincial targets using the number of household served in the base year and the number of households in target years.

Additional number of households to be served by different type of facility by urban and rural area by municipality is the shortfall of the number of households to be served in target years comparing with either that in base year or in Phase I (details are referred to Supporting Report). However, when the number of households to be served in target year/s is less than or equal to that in base year, no additional number of households to be served is counted.

In the determination of the number of households to be served by flush type toilet, when the number of households to be served in the target year is higher than in base year, the target coverage is applied with conditions. When the target coverage is higher than Level III water supply coverage, the latter coverage is adopted, while in the other case, the target coverage is applied. In cases where the target coverage is less than that in base year, the base year coverage is adopted.

For Phase I, any type of existing sanitary facilities both in urban and rural areas is to be utilized during Phase I period. For Phase II, water-sealed toilet facilities in Phase I both in urban and rural areas are to be utilized.

The projected number of served households at the end of the Phase I period is 249,159. Additional households to be served totaled to 61,707, of which 18% is urban households and 82% is rural households. While at the end of Phase II period, the number of served households are 418,007 with additional households to be served at 180,101. Table 8.5.2 provides the number of households to be served by target year for urban and rural areas by municipality.

(2) School toilets

The service coverage or the number of public school students to be served is estimated by municipality for the years 2005 and 2010.

Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets)

Name of Municipality/City	Area	Phase I Coverage (2005)									Phase II Coverage (2010)								
		Total Households	No. of Served Households				Add'l. No. of Households to be Served				Total Households	No. of Served Households				Add'l. No. of Households to be Served			
			Flush	Pour Flush	VIP/Dry	Total	Flush	Pour Flush	VIP/Dry	Total		Flush	Pour Flush	VIP/Dry	Total	Flush	Pour Flush	VIP/Dry	Total
Ajuy	Urban	617	86	459	29	574	76	106	3	185	873	406	377	29	812	320			320
	Rural	7,293	547	4,376	547	5,470	547	1,164		1,711	9,982	1,392	7,344	547	9,283	845	2,968		3,813
	Total	7,910	633	4,835	576	6,044	623	1,270	3	1,896	10,855	1,798	7,721	576	10,095	1,165	2,968		4,133
Alimodian	Urban	1,545	216	1,221		1,437	160	41		201	2,048	953	952		1,905	737			737
	Rural	4,967	373	2,980	372	3,725		405		405	7,315	373	6,058	372	6,803		3,078		3,078
	Total	6,512	589	4,201	372	5,162	160	446		606	9,363	1,326	7,010	372	8,708	737	3,078		3,815
Anilao	Urban	391	55	291	18	364	36	149	18	203	555	258	240	18	516	203			203
	Rural	4,179	313	2,507	314	3,134	313	1,585	314	2,212	5,989	330	4,926	314	5,570	17	2,419		2,436
	Total	4,570	368	2,798	332	3,498	349	1,734	332	2,415	6,544	588	5,166	332	6,086	220	2,419		2,639
Badiangan	Urban	356	50	265	16	331	12	3	16	31	504	235	218	16	469	185			185
	Rural	4,628	347	2,777	347	3,471	318			318	6,166	347	5,040	347	5,734		2,263		2,263
	Total	4,984	397	3,042	363	3,802	330	3	16	349	6,670	582	5,258	363	6,203	185	2,263		2,448
Balasan	Urban	760	106	566	35	707	66	109		175	993	462	426	35	923	356			356
	Rural	4,376	328	2,626	328	3,282	303	2,124		2,427	5,967	328	4,893	328	5,549		2,267		2,267
	Total	5,136	434	3,192	363	3,989	369	2,233		2,602	6,960	790	5,319	363	6,472	356	2,267		2,623
Banate	Urban	324		241	60	301		75	60	135	452	210	150	60	420	210			210
	Rural	5,247		3,148	787	3,935		1,476	787	2,263	7,783		6,451	787	7,238		3,303		3,303
	Total	5,571		3,389	847	4,236		1,551	847	2,398	8,235	210	6,601	847	7,658	210	3,303		3,513
Barotac Nuevo	Urban	780	219	506		725		97		97	1,038	483	482		965	264			264
	Rural	7,939	595	4,763	596	5,954	412	703	481	1,596	10,866	1,516	7,993	596	10,105	921	3,230		4,151
	Total	8,719	814	5,269	596	6,679	412	800	481	1,693	11,904	1,999	8,475	596	11,070	1,185	3,230		4,415
Barotac Viejo	Urban	851	119	633	39	791	111	83		194	1,199	558	518	39	1,115	439			439
	Rural	6,496	487	3,898	487	4,872	485	2,816		3,301	9,731	1,358	7,205	487	9,050	871	3,307		4,178
	Total	7,347	606	4,531	526	5,663	596	2,899		3,495	10,930	1,916	7,723	526	10,165	1,310	3,307		4,617
Batad	Urban	281	39	209	13	261	13	173		186	342	159	146	13	318	120			120
	Rural	5,296	247	1,978	247	2,472	187	473		660	4,601	247	3,785	247	4,279		1,807		1,807
	Total	5,577	286	2,187	260	2,733	200	646		846	4,943	406	3,931	260	4,597	120	1,807		1,927
Bingawan	Urban	780	28	697		725		94		94	1,031	480	479		959	452			452
	Rural	1,913		1,148	287	1,435		110	287	397	2,527		2,063	287	2,350		915		915
	Total	2,693	28	1,845	287	2,160		204	287	491	3,558	480	2,542	287	3,309	452	915		1,367
Cabatuan	Urban	8,960	1,250	6,666	417	8,333	994			994	12,439	5,784	5,367	417	11,568	4,534			4,534
	Rural																		
	Total	8,960	1,250	6,666	417	8,333	994			994	12,439	5,784	5,367	417	11,568	4,534			4,534
Calinog	Urban	1,145	194	852	19	1,065		189		189	1,617	752	733	19	1,504	558			558
	Rural	9,862	1,645	5,752		7,397		2,193		2,193	14,311	150	13,159		13,309		7,407		7,407
	Total	11,007	1,839	6,604	19	8,462		2,382		2,382	15,928	902	13,892	19	14,813	558	7,407		7,965
Carles	Urban	537	75	399	25	499	72	135	25	232	730	340	314	25	679	265			265
	Rural	10,157	355	6,094	1,169	7,618	354	2,725	1,169	4,248	15,023	355	12,447	1,169	13,971		6,353		6,353
	Total	10,694	430	6,493	1,194	8,117	426	2,860	1,194	4,480	15,753	695	12,761	1,194	14,650	265	6,353		6,618
Concepcion	Urban	899	125	711		836	125	40		165	1,500	698	697		1,395	573			573
	Rural	5,914	444	3,549	443	4,436	444	1,856	443	2,743	8,335	444	6,865	443	7,752		3,316		3,316
	Total	6,813	569	4,260	443	5,272	569	1,896	443	2,908	9,835	1,142	7,562	443	9,147	573	3,316		3,889
Dingle	Urban	1,249	59	1,130		1,189					1,614	751	750		1,501	692			692
	Rural	6,159		5,255		5,255					8,313	1,160	6,571		7,731	1,160	1,316		2,476
	Total	7,408	59	6,385		6,444					9,927	1,911	7,321		9,252	1,852	1,316		3,168
Duenas	Urban	998	139	742	47	928	99	3		102	1,461	680	632	47	1,359	541			541
	Rural	4,966	373	2,980	372	3,725	369	605		974	6,763	373	5,545	372	6,290		2,565		2,565
	Total	5,964	512	3,722	419	4,653	468	608		1,076	8,224	1,053	6,177	419	7,649	541	2,565		3,106

Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets) (Cont'd)

Name of Municipality/City	Area	Phase I Coverage (2005)									Phase II Coverage (2010)								
		Total Households	No. of Served Households				Add'l. No. of Households to be Served				Total Households	No. of Served Households				Add'l. No. of Households to be Served			
			Flush	Pour Flush	VIP/Dry	Total	Flush	Pour Flush	VIP/Dry	Total		Flush	Pour Flush	VIP/Dry	Total	Flush	Pour Flush	VIP/Dry	Total
Dumangas	Urban	409	57	323		380	28			28	510	237	237		474	180			180
	Rural	10,580	794	6,348	793	7,935	786	7	793	1,586	14,286	1,993	10,500	793	13,286	1,199	4,152		5,351
	Total	10,989	851	6,671	793	8,315	814	7	793	1,614	14,796	2,230	10,737	793	13,760	1,379	4,152		5,531
Estancia	Urban	1,839	257	1,368	85	1,710	64	670		734	2,692	1,252	1,167	85	2,504	995			995
	Rural	6,048	454	3,629	453	4,536	306	1,515		1,821	8,898	454	7,368	453	8,275		3,739		3,739
	Total	7,887	711	4,997	538	6,246	370	2,185		2,555	11,590	1,706	8,535	538	10,779	995	3,739		4,734
Guimbal	Urban	1,563	218	1,163	73	1,454	169	21	17	207	2,386	1,110	1,036	73	2,219	892			892
	Rural	4,727	355	3,190		3,545	6			6	7,017	355	6,171		6,526		2,981		2,981
	Total	6,290	573	4,353	73	4,999	175	21	17	213	9,403	1,465	7,207	73	8,745	892	2,981		3,873
Igbaras	Urban	1,122	156	887		1,043	41			41	1,569	730	729		1,459	574			574
	Rural	4,578	343	2,747	344	3,434	343	428	344	1,115	5,858	343	4,761	344	5,448		2,014		2,014
	Total	5,700	499	3,634	344	4,477	384	428	344	1,156	7,427	1,073	5,490	344	6,907	574	2,014		2,588
Janiuay	Urban	1,884	263	1,489		1,752	71			71	2,522	1,173	1,172		2,345	910			910
	Rural	9,167		3,199	3,843	7,042					13,048	168	8,124	3,843	12,135	168	4,925		5,093
	Total	11,051	263	4,688	3,843	8,794	71			71	15,570	1,341	9,296	3,843	14,480	1,078	4,925		6,003
Lambunao	Urban	893	125	705		830	85			85	1,350	628	628		1,256	503			503
	Rural	11,439	659	7,920		8,579	124			124	17,262	659	15,395		16,054		7,475		7,475
	Total	12,332	784	8,625		9,409	209			209	18,612	1,287	16,023		17,310	503	7,475		7,978
Leganes	Urban	1,469	285	1,081		1,366		96		96	2,041	949	949		1,898	664			664
	Rural	2,662	42	1,635	353	2,030					3,864	150	3,091	353	3,594	108	1,456		1,564
	Total	4,131	327	2,716	353	3,396		96		96	5,905	1,099	4,040	353	5,492	772	1,456		2,228
Lemery	Urban	641	18	477	101	596		152		152	849	395	294	101	790	377			377
	Rural	4,209	41	2,526	590	3,157		707		707	5,634	41	4,609	590	5,240		2,083		2,083
	Total	4,850	59	3,003	691	3,753		859		859	6,483	436	4,903	691	6,030	377	2,083		2,460
Leon	Urban	1,087	152	859		1,011	113	6		119	1,536	714	714		1,428	562			562
	Rural	8,468	635	5,081	635	6,351	607	795	577	1,979	12,727	1,350	9,851	635	11,836	715	4,770		5,485
	Total	9,555	787	5,940	635	7,362	720	801	577	2,098	14,263	2,064	10,565	635	13,264	1,277	4,770		6,047
Maasin	Urban	567		540		540					852	396	396		792	396			396
	Rural	4,807	361	2,884	360	3,605	74			74	7,099	730	5,512	360	6,602	369	2,628		2,997
	Total	5,374	361	3,424	360	4,145	74			74	7,951	1,126	5,908	360	7,394	765	2,628		3,393
Miagao	Urban	1,549	216	1,225		1,441	138			138	2,270	1,056	1,055		2,111	840			840
	Rural	9,188	689	6,202		6,891	689	187		876	12,084	689	10,549		11,238		4,347		4,347
	Total	10,737	905	7,427		8,332	827	187		1,014	14,354	1,745	11,604		13,349	840	4,347		5,187
Mina	Urban	471	66	372		438	65	14		79	711	331	330		661	265			265
	Rural	2,952	221	1,771	222	2,214	221	88	222	531	4,307	221	3,563	222	4,006		1,792		1,792
	Total	3,423	287	2,143	222	2,652	286	102	222	610	5,018	552	3,893	222	4,667	265	1,792		2,057
New Lucena	Urban	552	74	421		495	74	21		95	735	342	342		684	268			268
	Rural	2,819		2,242		2,242					3,926	270	3,381		3,651	270	1,139		1,409
	Total	3,351	74	2,663		2,737	74	21		95	4,661	612	3,723		4,335	538	1,139		1,677
Oton	Urban	13,608	1,898	10,124	633	12,655	1,881	123	633	2,637	19,374	9,009	8,376	633	18,018	7,111			7,111
	Rural																		
	Total	13,608	1,898	10,124	633	12,655	1,881	123	633	2,637	19,374	9,009	8,376	633	18,018	7,111			7,111
Passi City	Urban	1,751	244	1,302	82	1,628	233	38	82	353	2,521	1,173	1,090	82	2,345	929			929
	Rural	10,860	815	6,516	814	8,145	809	2,559	814	4,182	15,009	2,094	11,050	814	13,958	1,279	4,534		5,813
	Total	12,611	1,059	7,818	896	9,773	1,042	2,597	896	4,535	17,530	3,267	12,140	896	16,303	2,208	4,534		6,742
Pavia	Urban	1,900	513	1,254		1,767		391		391	2,859	1,330	1,329		2,659	817	75		892
	Rural	4,907	634	2,075	1,017	3,724					7,204	1,005	4,678	1,017	6,700	371	2,605		2,976
	Total	6,807	1,147	3,327	1,017	5,491		391		391	10,063	2,335	6,007	1,017	9,359	1,188	2,680		3,868

Table 8.5.2 Additional Number of Households to be Served by Target Year (Household Toilets) (Cont'd)

Name of Municipality/City	Area	Phase I Coverage (2005)									Phase II Coverage (2010)								
		Total Households	No. of Served Households				Add'l. No. of Households to be Served				Total Households	No. of Served Households				Add'l. No. of Households to be Served			
			Flush	Pour Flush	VIP/Dry	Total	Flush	Pour Flush	VIP/Dry	Total		Flush	Pour Flush	VIP/Dry	Total	Flush	Pour Flush	VIP/Dry	Total
Pototan	Urban	3,419	477	2,544	159	3,180	190			190	4,874	2,267	2,107	159	4,533	1,790			1,790
	Rural	8,797	689	5,278	631	6,598		559		559	12,192	435	10,273	651	11,339		4,995		4,995
	Total	12,216	1,166	7,822	790	9,778	190	559		749	17,066	2,702	12,380	790	15,872	1,790	4,995		6,785
San Dionisio	Urban	1,027	143	764	48	955	126	560	26	712	1,597	743	694	48	1,485	600			600
	Rural	4,662	350	2,798	349	3,497	323	1,512		1,835	6,322	350	5,180	349	5,879		2,382		2,382
	Total	5,689	493	3,562	397	4,452	449	2,072	26	2,547	7,919	1,093	5,874	397	7,364	600	2,382		2,982
San Enrique	Urban	429	145	254		399		31		31	590	275	274		549	130	20		150
	Rural	4,987	363	2,992	385	3,740		1,672		1,672	7,110	363	5,864	385	6,612		2,872		2,872
	Total	5,416	508	3,246	385	4,139		1,703		1,703	7,700	638	6,138	385	7,161	130	2,892		3,022
San Joaquin	Urban	972	136	723	45	904	84	121	35	240	1,436	668	622	45	1,335	532			532
	Rural	9,232	692	5,539	693	6,924	638	1,383	650	2,671	13,871	1,935	10,272	693	12,900	1,243	4,733		5,976
	Total	10,204	828	6,262	738	7,828	722	1,504	685	2,911	15,307	2,603	10,894	738	14,235	1,775	4,733		6,508
San Miguel	Urban	2,988	417	2,362		2,779	357			357	4,402	2,047	2,047		4,094	1,630			1,630
	Rural	1,367		1,042		1,042					1,976		1,838		1,838		796		796
	Total	4,355	417	3,404		3,821	357			357	6,378	2,047	3,885		5,932	1,630	796		2,426
San Rafael	Urban	685		510	127	637		259	127	386	929	432	305	127	864	432			432
	Rural	1,955		1,173	293	1,466		706	293	999	3,213		2,695	293	2,988		1,522		1,522
	Total	2,640		1,683	420	2,103		965	420	1,385	4,142	432	3,000	420	3,852	432	1,522		1,954
Santa Barbara	Urban	1,683	882	683		1,565		162		162	2,302	1,071	1,070		2,141	189	387		576
	Rural	7,365	2,238	3,286		5,524		460		460	10,491	1,315	8,442		9,757		5,156		5,156
	Total	9,048	3,120	3,969		7,089		622		622	12,793	2,386	9,512		11,898	189	5,543		5,732
Sara	Urban	846	118	630	39	787	116	195		311	1,080	502	463	39	1,004	384			384
	Rural	7,965	582	4,779	613	5,974	582	1,678		2,260	11,697	434	9,831	613	10,878		5,052		5,052
	Total	8,811	700	5,409	652	6,761	698	1,873		2,571	12,777	936	10,294	652	11,882	384	5,052		5,436
Tigbauan	Urban	1,712	239	1,274	79	1,592	104	56	79	239	2,615	1,216	1,137	79	2,432	977			977
	Rural	8,942	671	5,366	670	6,707	511	180	670	1,361	13,699	671	11,399	670	12,740		6,033		6,033
	Total	10,654	910	6,640	749	8,299	615	236	749	1,600	16,314	1,887	12,536	749	15,172	977	6,033		7,010
Tubungan	Urban	341	55	254	8	317		46	5	51	511	238	229	8	475	183			183
	Rural	4,392	234	2,635	425	3,294	220			220	6,731	234	5,601	425	6,260		2,966		2,966
	Total	4,733	289	2,889	433	3,611	220	46	5	271	7,242	472	5,830	433	6,735	183	2,966		3,149
Zarraga	Urban	743	152	539		691		133		133	1,056	491	491		982	339			339
	Rural	3,651	41	1,818	945	2,804					5,707	41	4,322	945	5,308		2,504		2,504
	Total	4,394	193	2,357	945	3,495		133		133	6,763	532	4,813	945	6,290	339	2,504		2,843
Provincial Total	Urban	66,603	10,066	49,715	2,197	61,978	5,703	4,392	1,126	11,221	94,565	43,984	41,764	2,197	87,945	33,918	482		34,400
	Rural	248,118	17,957	148,500	20,724	187,181	9,971	32,671	7,844	50,486	354,904	24,673	284,665	20,724	330,062	9,536	136,165		145,701
	Total	314,721	28,023	198,215	22,921	249,159	15,674	37,063	8,970	61,707	449,469	68,657	326,429	22,921	418,007	43,454	136,647		180,101

The future service coverage and additional number of students to be served are estimated using the number of students served in the base year, the number of students in target years and the provincial sector targets.

Additional number of students to be served by municipality is the shortfall of the number of students to be served in targets comparing with either that in base year or in Phase I (details are referred to Supporting Report). However, when the number of students to be served in target/s is less than or equal to the base year, no additional number of households to be served is considered.

The existing facilities are to be utilized during Phase I period, while the facilities in Phase I are to be utilized during Phase II period.

The projected number of served students at the end of Phase I period is 261,889. The additional students to be served are 114,438. While at the end of Phase II period, the projected number of served students are 381,935 with additional students to be served at 120,121. Table 8.5.3 summarizes the number of public school students to be served by target year.

(3) Public toilets

The service coverage of public utilities with sanitary toilet facility by municipality is estimated for the years 2005 and 2010.

The future service coverage and additional coverage are estimated using the existing number of public utilities with sanitary toilets in the base year, the number of public utilities in target years, and provincial sector targets.

The additional number of public utilities with sanitary toilets needed by municipality is the shortfall of the number of public utilities in target year comparing with either the existing coverage or Phase I coverage (details are referred to Supporting Report).

The existing sanitary facilities are to be utilized during Phase I period. The facilities in Phase I are to be utilized during Phase II period.

The number of served public utilities at the end of Phase I period is 449. The additional public utilities to be served are 158. While at the end of Phase II period, the number of served public utilities are 659 with additional public utilities to be served at 210. Table

8.5.4 summarizes the additional number of public utilities to be served by municipality by target year.

Table 8.5.3 Additional Number of Public School Student to be Served by Target Year (School Toilets)

Name of Municipality/City	Phase I Coverage (2005)			Phase II Coverage (2010)		
	Total No. of Public School Student	Std. No. of Public School Students to be Served	Add'l. No. of Public School Student to be Served	Total No. of Public School Student	Std. No. of Public School Students to be Served	Add'l. No. of Public School Student to be Served
Ajuy	10,566	7,629	3,589	11,804	10,624	2,995
Alimodian	6,451	2,271	2,191	7,627	6,864	4,593
Anilao	6,350	4,237	2,157	7,020	6,318	2,081
Badiangan	5,233	4,420		5,739	5,165	745
Balasan	6,852	3,967	2,327	7,680	6,912	2,945
Banate	8,142	6,726	2,766	8,938	8,044	1,318
Barotac Nuevo	9,126	3,100	3,100	10,113	9,102	6,002
Barotac Viejo	10,018	6,323	3,403	11,564	10,408	4,085
Batad	3,200	2,707		3,706	3,335	628
Bingawan	3,598	1,302	1,222	3,909	3,518	2,216
Cabatuan	8,989	8,173	3,053	10,046	9,041	868
Calinog	13,825	10,256	4,696	15,074	13,567	3,311
Carles	15,090	10,726	5,126	17,592	15,833	5,107
Concepcion	8,078	6,664	2,744	9,455	8,510	1,846
Dingle	7,983	6,552	2,712	8,876	7,988	1,436
Dueñas	6,561	4,920		5,651	5,086	166
Dumangas	10,287	10,214	3,494	13,133	11,820	1,606
Estancia	9,959	8,104		12,605	11,345	3,241
Guimbal	8,098	3,671	2,751	8,948	8,053	4,382
Igbaras	6,851	2,407	2,327	7,461	6,715	4,308
Janiuay	14,873	9,532	5,052	15,675	14,108	4,576
Lambunao	15,092	12,086	5,126	17,105	15,395	3,309
Leganes	5,814	4,655	1,975	6,159	5,543	888
Lemery	5,950	5,381	2,021	6,779	6,101	720
Leon	12,223	10,312	4,152	13,787	12,408	2,096
Maasin	7,553	7,286	2,566	8,029	7,226	
Miagao	12,460	9,120		13,453	12,108	2,988
Mina	4,520	4,655	1,535	5,144	4,630	
New Lucena	4,218	3,993	1,433	4,701	4,231	238
Oton	15,395	7,989	5,229	17,784	16,006	8,017
Passi City	17,327	14,646	5,886	18,226	16,403	1,757
Pavia	7,692	5,373	2,613	9,214	8,293	2,920
Pototan	13,586	4,855	4,615	16,171	14,554	9,699
San Dionisio	8,332	6,630	2,830	9,186	8,267	1,637
San Enrique	6,036	3,610	2,050	6,880	6,192	2,582
San Joaquin	11,091	5,567	3,767	12,591	11,332	5,765
San Miguel	5,602	4,823	1,903	6,324	5,692	869
San Rafael	3,892	2,802	1,322	4,590	4,131	1,329
Santa Barbara	8,658	7,070		10,133	9,120	2,050
Sara	10,902	6,943	3,703	13,092	11,783	4,840
Tigbauan	9,918	4,849	3,369	12,984	11,686	6,837
Tubungan	5,016	3,984	1,704	5,590	5,031	1,047
Zarraga	2,734	1,369	929	3,830	3,447	2,078
Provincial Total	374,141	261,899	111,438	424,368	381,935	120,121

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

Name of Municipality/City	Type	Phase I Coverage (2005)		Phase II Coverage (2010)	
		Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utility with Sanitary Toilets	Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utilities with Sanitary Toilets
Aiuv	Public Market	1	1	1	2
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	3	3	4	7
Alimodian	Public Market	1	5	2	7
	Bus/Jeepney Terminal	1	3	1	4
	Parks/Playground	1	3	2	5
	Total	3	11	5	16
Anilao	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	3	1	4
	Total	3	7	3	10
Badiangan	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	4	1	5
	Total	3	8	3	11
Balasan	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	3	1	4
	Total	3	7	3	10
Banate	Public Market	1	7	1	8
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	3	9	4	13
Barotac Nuevo	Public Market	1	5	2	7
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	3	1	4
	Total	3	9	4	13
Barotac Viejo	Public Market	1	7	1	8
	Bus/Jeepney Terminal	1	8	1	9
	Parks/Playground	1	3	2	5
	Total	3	18	4	22
Batad	Public Market	1	9	1	10
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	7	1	8
	Total	3	17	3	20
Bingawan	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	3	2	5
	Total	3	7	4	11
Cabatuan	Public Market	1	7	2	9
	Bus/Jeepney Terminal	1	1	2	3
	Parks/Playground	1	3	1	4
	Total	3	11	5	16
Calinog	Public Market	1	7	2	9
	Bus/Jeepney Terminal	1	1	2	3
	Parks/Playground	1	1	3	4
	Total	3	9	7	16
Carles	Public Market	3	3	2	5
	Bus/Jeepney Terminal	1	1	2	3
	Parks/Playground	3	3	2	5
	Total	7	7	6	13

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

(Cont'd)

Name of Municipality/City	Type	Phase I Coverage (2005)		Phase II Coverage (2010)	
		Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utility with Sanitary Toilets	Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utilities with Sanitary Toilets
Concepcion	Public Market	1	7	1	8
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	5	2	7
	Total	3	13	4	17
Dingle	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	3	2	5
	Total	3	7	4	11
Dueñas	Public Market	1	4	1	5
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	1	2
	Total	3	6	3	9
Dumangas	Public Market	1	3	2	5
	Bus/Jeepney Terminal	1	2	1	3
	Parks/Playground	1	5	2	7
	Total	3	10	5	15
Estancia	Public Market	1	5	1	6
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	3	7	4	11
Guimbal	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	5	2	7
	Total	3	9	4	13
Igbaras	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	3	5	4	9
Janiuay	Public Market	1	11	2	13
	Bus/Jeepney Terminal	1	3	2	5
	Parks/Playground	1	8	2	10
	Total	3	22	6	28
Lambunao	Public Market	2	4	2	6
	Bus/Jeepney Terminal	2	2	1	3
	Parks/Playground	2	2	2	4
	Total	6	8	5	13
Leganes	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	3	2	5
	Parks/Playground	1	1	2	3
	Total	3	7	5	12
Lemery	Public Market	1	1	1	2
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	3	3	4	7
Leon	Public Market	2	6	2	8
	Bus/Jeepney Terminal	1	1	2	3
	Parks/Playground	1	5	2	7
	Total	4	12	6	18
Maasin	Public Market	1	9	1	10
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	3	11	4	15

Table 8.5.4 Additional Number of Public Utilities with Sanitary Toilets by Target Year

(Cont'd)

Name of Municipality/City	Type	Phase I Coverage (2005)		Phase II Coverage (2010)	
		Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utility with Sanitary Toilets	Add'l. No. of Public Utility with Sanitary Toilets	No. of Public Utilities with Sanitary Toilets
Miagao	Public Market	2	8	3	11
	Bus/Jeepney Terminal	2	4	2	6
	Parks/Playground	2	4	2	6
	Total	6	16	7	23
Mina	Public Market		2	1	3
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	2	3
	Total	2	4	4	8
New Lucena	Public Market	1	7	1	8
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	7	2	9
	Total	3	15	4	19
Oton	Public Market	1	5	2	7
	Bus/Jeepney Terminal	1	3	1	4
	Parks/Playground	1	5	3	8
	Total	3	13	6	19
Passi City	Public Market	7	17	2	19
	Bus/Jeepney Terminal	2	9	2	11
	Parks/Playground	1	17	2	19
	Total	10	43	6	49
San Miguel	Public Market	1	3	2	5
	Bus/Jeepney Terminal	1	1	2	3
	Parks/Playground	1	3	2	5
	Total	3	7	6	13
San Rafael	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	1	3	4
	Total	3	5	5	10
Santa Barbara	Public Market	2	4	2	6
	Bus/Jeepney Terminal	2	2	2	4
	Parks/Playground	6	16	2	18
	Total	10	22	6	28
Sara	Public Market	2	4	2	6
	Bus/Jeepney Terminal	2	4	2	6
	Parks/Playground	1	5	3	8
	Total	5	13	7	20
Tigbauan	Public Market	1	3	1	4
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	3	3	6
	Total	3	7	5	12
Tubungan	Public Market	1	5	2	7
	Bus/Jeepney Terminal	1	1	2	3
	Parks/Playground	1	3	5	8
	Total	3	9	9	18
Zarraga	Public Market	1	3	2	5
	Bus/Jeepney Terminal	1	1	1	2
	Parks/Playground	1	2	2	4
	Total	3	6	5	11
Provincial Total	Public Market	56	209	63	272
	Bus/Jeepney Terminal	49	80	57	137
	Parks/Playground	53	160	90	250
	Total	158	449	210	659

8.5.3 Urban Sewerage

The service coverage in 2010 (Phase II) is estimated for the municipalities with population of more than 10,000 in urban area provided by Level III water supply. It is assumed that half of the population in the area/s is to be served by the sewerage systems. Table 8.5.5 shows the population to be served in Phase II.

Table 8.5.5 Population to be Served by Urban Sewerage in Phase II

Name of Municipality/City	Urban Population in 2010	Level III Water Supply Coverage	Population to be Served
Cabatuan	49,757	47,269	24,879
Estancia	10,766	10,228	5,383
Janiuay	10,086	9,582	5,043
Lambunao	5,398	5,128	
Oton	77,497	73,622	38,749
Passi City	10,084	9,580	5,042
Pavia	11,437	10,865	5,719
San Miguel	17,609	16,729	8,805
Tigbauan	10,461	9,938	5,231
Provincial Total	378,243	359,333	108,599

8.5.4 Solid Waste

Future requirements in the sub-sector are studied giving priority to urban area for the Phase I. Staged improvement for the rural area shall be studied in the future.

Service coverage in Phase I was assumed at 100% with reference to the present service coverage of 98% in urban area. Additional service coverage in Phase I is calculated as a shortfall of target coverage in Phase I comparing with current service coverage. Table 8.5.6 presents additional service coverage for Phase I in the urban area.

8.6 Facilities, Equipment and Rehabilitation to Meet the Target Services

8.6.1 Water Supply

(1) Required facilities

Water supply facilities required by service level were estimated by urban and rural area by municipality based on the additional service coverage by target year and summarized in Table 8.6.1 (details are referred to Supporting Report).

Table 8.5.6 Additional Number of Urban Households to be Served by Municipal Solid Waste System in Phase I

Name of Municipality/City	No. of Urban Households Served in the Base Year	Phase I Coverage (2005)		
		No. of Urban Households	Urban Households Coverage	Add'l. No. of Urban Households to be Served
Ajuy	1,087	617	1,087	
Alimodian	658	1,545	1,545	887
Anilao	254	391	391	137
Badiangan	338	356	356	18
Balasan	612	760	760	148
Banate	875	324	875	
Barotac Nuevo	711	780	780	69
Barotac Viejo	777	851	851	74
Batad	1,631	281	1,631	
Bingawan	359	780	780	421
Cabatuan	1,857	8,960	8,960	7,103
Calinog	3,978	1,145	3,978	
Carles	3,953	537	3,953	
Concepcion	642	899	899	257
Dingle	2,594	1,249	2,594	
Dueñas	913	998	998	85
Dumangas	1,989	409	1,989	
Estancia	2,127	1,839	2,127	
Guimbal	1,029	1,563	1,563	534
Igbaras	250	1,122	1,122	872
Janiuay	2,108	1,884	2,108	
Lambunao	2,984	893	2,984	
Leganes	230	1,469	1,469	1,239
Lemery	295	641	641	346
Leon	1,564	1,087	1,564	
Maasin	527	567	567	40
Miagao	1,371	1,549	1,549	178
Mina	832	471	832	
New Lucena	273	532	532	259
Oton	2,070	13,608	13,608	11,538
Passi City	3,445	1,751	3,445	
Pavia	1,558	1,900	1,900	342
Pototan	4,464	3,419	4,464	
San Dionisio	2,024	1,027	2,024	
San Enrique	875	429	875	
San Joaquin	855	972	972	117
San Miguel	701	2,988	2,988	2,287
San Rafael	200	685	685	485
Santa Barbara	2,245	1,683	2,245	
Sara	1,859	846	1,859	
Tigbauan	458	1,712	1,712	1,254
Tubungan	399	341	399	
Zarraga	206	743	743	537
Provincial Total	58,177	66,603	87,404	29,227

Urban water supply:

Physical requirements of Level III systems were estimated as the number of required house connections. Mode of project indicates whether future urban water supply will be

Table 8.6.1 Water Supply Facilities Required by Target Year

Name of Municipality/City	Phase I (2005) Requirements											Phase I (2010) Requirements							
	Urban Water Supply (Level III)			Rural Water Supply								Urban WS (Level III)		Rural Water Supply					
				Level II		Level I								Level I					
	Mode of Project	No. of Add'l. Water Source	No. of HHs Connection	No. of System	No. of Communal Faucets	Number of Deep Wells				No. of Shallow Wells	Total No. of Wells	No. of Add'l. Water Source	No. of HHs Connection	Number of Deep Wells				No. of Shallow Wells	Total No. of Wells
						40 m	80 m	120 m	Sub-total					40 m	80 m	120 m	Sub-total		
Ajuy	N/A			3								1	107	168			168	42	210
Alimodian	Expansion	1	202	8	129							1	883	62			62	62	124
Anilao	Expansion	1	51			35			35	1	36	1	185	171			171	9	180
Badiangan	N/A											1	356		32		32		32
Balasan	New	1	99			31			31	7	38	1	815	69			69	17	86
Banate	N/A					43			43	2	45	1	429	173			173	9	182
Barotac Nuevo	N/A											1	483	45			45		45
Barotac Viejo	Expansion	1	111			12			12	44	56	1	994	39			39	153	192
Batad	N/A					9			9	20	29	1	130	26			26	58	84
Bingawan	N/A						17		17		17	1	979		82		82	4	86
Cabatuan	Expansion	1	1,170									6	9,645						
Calinog	Expansion	1	150				60		60	25	85	1	901		385		385	164	549
Carles	New	1	70	4	80	37			37	24	61	1	605	348			348	231	579
Concepcion	New	1	117			6			6	45	51	1	1,261	24			24	214	238
Dingle	N/A			1								1	1,044	65			65	3	68
Dueñas	N/A					43			43		43	1	901	84			84		84
Dumangas	Expansion	1	53			92			92		92	1	127	388			388		388
Estancia	Expansion	1	240			11			11	41	52	1	1,422	55			55	218	273
Guimbal	N/A					41			41		41	1	1,340	146			146		146
Igbaras	New	1	146			28			28	12	40	1	1,304	91			91	38	129
Janiuay	Expansion	1	246				40		40	39	79	1	1,481		23		23	22	45
Lambunao	New	1	117				60		60	39	99	1	1,117		317		317	211	528
Leganes	Expansion	1	192	5	69							1	1,618	60			60		60
Lemery	N/A											1	807	82			82	20	102
Leon	Expansion	1	142			37			37	36	73	1	830	123			123	122	245
Maasin	Expansion	1	74				21		21	21	42	1	554		57		57	56	113
Miagao	Expansion	1	202			56			56	23	79	1	1,350	142			142	60	202
Mina	New	1	61				26		26		26	1	593		89		89		89
New Lucena	Expansion	1	69									1	610		73		73		73
Oton	Expansion	2	1,776									9	15,431						
Passi City	N/A											1	258		216		216	53	269
Pavia	N/A											1	1,255	137			137		137
Pototan	N/A					76			76		76	2	3,040	182			182		182
San Dionisio	Expansion	1	134	1	20	17			17	17	34	1	658	77			77	76	153
San Enrique	New	1	56				35		35	8	43	1	486		122		122	30	152
San Joaquin	Expansion	1	127	2	40	61			61	6	67	1	864	329			329	36	365
San Miguel	N/A											3	3,979		22		22		22
San Rafael	N/A					7			7	10	17	1	882	24			24	36	60
Santa Barbara	N/A											1	1,904	193			193		193
Sara	N/A			1								1	881	100			100	42	142
Tigbauan	New	1	224			77			77		77	2	2,174	443			443		443
Tubungan	New	1	45			16			16	22	38	1	427	51			51	76	127
Zarraga	New	1	97			32			32		32	1	878	135			135		135
Provincial Total	Exp.- 16 New- 10	27	5,971	25	338	767	259		1,026	442	1,468	60	65,988	4,032	1,418		5,450	2,062	7,512

implemented as expansion of existing system or construction of a new system. The number of water sources was also estimated based on the water source evaluation results in Chapter 7.

Rural water supply:

Physical requirements of Level II systems were estimated as the number of systems and number of communal faucets, while that of Level I facilities were first estimated as the number of wells with classification of deep and shallow wells. Deep wells were further subdivided in terms of three different standard depths based on the water source evaluation results.

Furthermore, as for Level I facilities, in this PW4SP, 50% of the total required facilities will be implemented by public (LGUs) and 5% of these public Level I facilities will be allocated to spring development for some municipalities (detailed are referred to Supporting Report).

(2) Rehabilitation

Rehabilitation requirements were estimated as 10% of the total number of deep wells to be constructed under PW4SP. Rehabilitation work will be mainly redevelopment of wells by means of air surging, while minor repair of concrete apron and hand-pump will be undertaken by respective beneficiary organizations.

(3) Equipment

Logistic support:

For rural water supply development, 1 unit each or set of the following equipment was considered necessary for the provincial government to conduct various activities of PW4SP implementation;

Transportation- service vehicle

Office equipment- computer with printer, typewriter, mimeo machine, scanning machine and copier

Field equipment- sound system, tape recorder and tools for maintenance

For urban water supply, no hardware was considered.

Well drilling and rehabilitation equipment:

As a reference information, necessary types and number of well drilling and rehabilitation equipment were studied considering the existing equipment of sector agencies in the province.

During Phase I, a total of 506 Level I deep wells shall be newly constructed by public (LGUs) and 10% of these deep wells shall be rehabilitated annually (details are referred to Supporting Report). Presently, the DEOs-DPWH have a total of three (3) operational rotary/percussion type drilling rig which are applicable for 6 - 18" of bore hole diameter and 120 - 160 m of well depth.

Therefore, a total of 8 sets of drilling rigs (medium size percussion type) together with 2 sets of well rehabilitation equipment, 2 units of support vehicle for well rehabilitation and 8 units of service truck for deep well construction shall be mobilized/procured either by the private sector or LGUs (details are referred to Supporting Report).

Selection of well drilling machine

An appropriate type of well drilling machine with its specifications shall be selected after comprehensive study on the technical requirements, local capability in O&M of the machine and cost effectiveness.

From the technical viewpoint, geological conditions in the province allow for the use of either rotary or percussion type drilling machine (no rock drilling is expected). While, in view of economical and O&M experience on the machine in the local area, a percussion type is recommendable. Although, the rotary type machine is quite effective to reduce construction period under soft soil condition, special training on mud-circulation, handling manner, etc. are required together with additional equipment and materials as compared with percussion type. The drilling speed of the percussion type is rather slow, but has advantages in drilling boulder and cobble formations.

One unit of truck mounted percussion drilling machine was considered to be procured in the long-term development period.

(4) Laboratory

Instrument/Equipment and Other Laboratory Accessory:

The provincial government will need at least two (2) sets of instruments/equipment in order to ensure regular water quality monitoring and surveillance activities for the entire

province. The distribution would be in 2 strategic municipalities where district hospitals are located. These are in the existing hospitals of Calinog and Sara.

The 2 new laboratories in Calinog and Sara will cover the northern and central municipalities, respectively. The following are the requirements:

	Item	Unit	New Laboratories Calinog	Sara
1.	Instrument/Equipment			
	Turbidity meter	set	1	1
	Color meter	set	1	1
	pH/Residual chlorine checker	set	1	1
	Incubator	set	1	1
	Refrigerator	set	1	1
	Sterilizer	set	1	1
	Portable water quality testing kit	set	1	1
	Electric stove	set	1	1
	Range hood	set	1	1
2.	Glassware/Chemical	set	1	1
3.	Accessory			
	Sink	set	1	1
	Working table	set	1	1
	Shelf	set	1	1
	Office desk	set	1	1
	Chair	set	1	1

8.6.2 Sanitation

This sub-section refers to physical requirements by target year covering household, school and public toilet facilities. Table 8.6.2 presents the required sanitation facilities by target year. Rehabilitation for the sanitation facilities is considered as part of recurrent cost.

(1) Household toilets

Future requirements in the number of household toilets by different type for urban and rural areas were estimated based on the additional households to be served by type of facility both for urban and rural areas by target year (details are referred to Supporting Report).

(2) School toilets

The future requirements in the number of toilet facilities were estimated based on the standard number of students to be served by a 5-unit standard facility or a toilet in every

Table 8.6.2 Sanitation Facilities Required by Target Year

Name of Municipality/City	Phase I (2005) Requirements													Phase II (2010) Requirements											
	Urban Sanitation								Rural Sanitation					Urban Sanitation								Rural Sanitation			
	No. of Households				No. of Public Sch. Toilets	No. of Public Toilets			No. of Households				No. of Public Sch. Toilets	No. of Households				No. of Public Sch. Toilets	No. of Public Toilets			No. of Households				No. of Public Sch. Toilets
	Flush	Pour Flush	VIP/ Dry	Total		Public Market	Bus/ Jeepney Terminal	Parks/ Playground	Flush	Pour Flush	VIP/ Dry	Total		Flush	Pour Flush	VIP/ Dry	Total		Public Market	Bus/ Jeepney Terminal	Parks/ Playground	Flush	Pour Flush	VIP/ Dry	Total	
Ajuy	76	106	3	185	1	1	1	1	547	1,164		1,711	17	320			320		1	1	2	845	2,968		3,813	49
Ahmedian	160	41		201	2	1	1	1		405		405	9	737			737	5	2	1	2		3,078		3,078	27
Amlan	36	149	18	203		1	1	1	313	1,585	314	2,212	10	203			203		1	1	1	17	2,419		2,436	29
Bachangan	12	3	16	31		1	1	1	318			318		185			185		1	1	1		2,263		2,263	24
Balasan	66	109		175	2	1	1	1	303	2,124		2,427	10	356			356	2	1	1	1		2,267		2,267	30
Banate		75	60	135		1	1	1		1,476	787	2,263	13	210			210		1	1	2		3,303		3,303	38
Barotac Nuevo		97		97	1	1	1	1	412	703	481	1,596	14	264			264	3	2	1	1	921	3,230		4,151	42
Barotac Viejo	111	83		194	2	1	1	1	485	2,816		3,301	15	439			439	2	1	1	2	871	3,307		4,178	46
Batad	13	173		186		1	1	1	187	473		660		120			120		1	1	1		1,807		1,807	16
Bingawan		94		94	2	1	1	1		110	287	397	4	452	3		455	3	1	1	2		915		915	12
Cabatuan	994			994	15	1	1	1						4,534			4,534	4	2	2	1					
Calinog		189		189	2	1	1	1		2,193		2,193	21	558			558	2	2	2	3		7,407		7,407	61
Carles	72	135	25	232		3	1	3	354	2,725	1,169	4,248	24	265			265		2	2	2		6,353		6,353	75
Concepcion	125	40		165	2	1	1	1	444	1,856	443	2,743	12	573			573	1	1	1	2		3,316		3,316	36
Dingle					2	1	1	1					11	692			692		1	1	2	1,160	1,316		2,476	33
Dueñas	99	3		102		1	1	1	369	605		974		541			541		1	1	1		2,565		2,565	21
Dumangas	28			28		1	1	1	786	7	793	1,586	17	180			180		2	1	2	1,199	4,152		5,351	57
Estancia	64	670		734		1	1	1	306	1,515		1,821		995			995	4	1	1	2		3,739		3,739	44
Guimbal	169	21	17	207	3	1	1	1	6			6	10	892			892	6	1	1	2		2,981		2,981	30
Igbaras	41			41	2	1	1	1	343	428	344	1,115	9	574			574	5	1	1	2		2,014		2,014	26
Janiuay	71			71	4	1	1	1					21	910			910	4	2	2	2	168	4,925		5,093	59
Lambunao	85			85	2	2	2	2	124			124	24	503			503		2	1	2		7,475		7,475	71
Leganes		96		96	3	1	1	1					6	664			664	2	1	2	2	108	1,456		1,564	18
Lemery		152		152	1	1	1	1		707		707	9	377			377		1	1	2		2,083		2,083	27
Leon	113	6		119	2	2	1	1	607	795	577	1,979	19	562			562		2	2	2	715	4,770		5,485	55
Mandurriao					1	1	1	1	74			74	11	396			396		1	1	2	569	2,628		2,997	32
Miagao	138			138		2	2	2	689	187		876		840	2		840	2	3	2	2		4,347		4,347	51
Mina	65	14		79			1	1	221	88	222	531	7	265			265		1	1	2		1,792		1,792	20
New Lucena	74	21		95		1	1	1					6	268			268		1	1	2	270	1,139		1,409	18
Oton	1,881	123	633	2,637	26	1	1	1						7,111	40	2	7,111		2	1	3					
Passi City	233	38	82	353	4	2	2	1	809	2,559	814	4,182	25	929			929	1	2	2	2	1,279	4,534		5,813	70
Pavia		391		391	4	1	1	1					9	817	75		892	4	1	1	2	371	2,605		2,976	30
Pototan	190			190	7	1	2	2		559		559	16	1,790			1,790	14	2	2	3		4,995		4,995	52
San Dionisio	126	560	26	712	3	1	1	1	323	1,512		1,835	12	600			600	2	1	1	2		2,382		2,382	33
San Enrique		31		31		1	1	1		1,672		1,672	9	130	20		150		1	1	2		2,872		2,872	29
San Joaquin	84	121	35	240	2	2	1	1	638	1,383	650	2,671	17	532			532	3	2	2	4	1,243	4,733		5,976	51
San Miguel	357			357	7	1	1	1					3	1,630			1,630	3	2	2	2		796		796	9
San Rafael		259	127	386	2	1	1	1		706	293	999	5	432			432	1	1	1	3		1,527		1,527	16
Santa Barbara		162		162		2	2	6		460		460		189	387		576	2	2	2	2		5,156		5,156	37
Sara	116	195		311	2	2	2	1	582	1,678		2,260	17	384			384	2	2	2	3		5,052		5,052	54
Tigbauan	103	56	79	239	3	1	1	1	511	180	670	1,361	14	977			977	5	1	1	3		6,033		6,033	49
Tubungan		46	5	51		1	1	1	220			220	8	183			183		2	2	2		2,966		2,966	24
Zarraga		133		133		1	1	1					4	339			339	2	2	1	2		2,504		2,504	18
Provincial Total	5,703	4,393	1,126	11,221	109	56	49	53	9,971	32,671	7,844	50,486	438	33,918	482		34,400	124	63	57	90	9,536	136,165		145,701	1,515

classroom (50-50 sharing) and the additional students to be served by target (details are referred to Supporting Report).

Total required facilities were further broken down into urban and rural areas by applying the percentage share of urban and rural population.

8.6.3 Urban Sewerage and Solid Waste

Physical requirements for the sewerage facilities are not discussed in this sub-section. Further study shall be conducted in the future.

As reference information, the number of refuse collection trucks is estimated for the urban area in Phase I. Twenty five (25) additional units of truck are required to meet assumed service coverage as reflected in Table 8.6.3.

8.7 Identification of Priority Projects for Medium-Term Development Plan

In general, the present service coverage by municipality with reference to the target coverage indicates the direction of development effort for implementing PW4SP with municipal priorities.

Specific projects shall be selected subject to detailed studies and will not be discussed in the provincial master plan. In addition, pertinent information to identify priority projects is not available both at provincial and municipal level during this PW4SP preparation, except some future expansion work for WDs.

The general criteria for identifying priority projects as guide for implementing the PW4SP are summarized below.

The first level of priority should be given to projects with positive feasibility studies and identified funding. Next level of priority should be given to projects with positive feasibility studies, although no funding source has been identified. The third level should be for which feasibility study has been conducted. Within each level, if funds were insufficient, a ranking could be carried out applying some factors, such as willingness to pay, water-related diseases status and per capita cost. Under the above-mentioned conditions, the implementors should prepare a list of projects.

Table 8.6.3 Number of Refuse Collection Trucks Required in Phase I

Name of Municipality/City	Additional Urban Households to be Served	Estimated Daily Amount of Refuse to beGenerated, (Kg)	Number of Collection Truck Required
Aiuy			
Alimodian	887	371	1
Anilao	137	58	1
Badiangan	18	8	1
Balasan	148	62	1
Banate			
Barotac Nuevo	69	29	1
Barotac Viejo	74	31	1
Batad			
Bingawan	421	176	1
Cabatuan	7,103	2,970	1
Calinog			
Carles			
Concepcion	257	108	1
Dingle			
Dueñas	85	36	1
Dumangas			
Estancia			
Guimbal	534	224	1
Igbaras	872	365	1
Janiuay			
Lambunao			
Leganes	1,239	518	1
Lemery	346	145	1
Leon			
Maasin	40	17	1
Miagao	178	75	1
Mina			
New Lucena	259	109	1
Oton	11,538	4,823	2
Passi City			
Pavia	342	143	1
Pototan			
San Dionisio			
San Enrique			
San Joaquin	117	49	1
San Miguel	2,287	956	1
San Rafael	485	203	1
Santa Barbara			
Sara			
Tigbauan	1,254	525	1
Tubungan			
Zarraga	537	225	1
Provincial Total	29,227	12,226	25

Due attention shall be paid on the importance of integrated development of relevant sub-sectors to maximize the effects and benefits through simultaneous implementation of water supply and sanitation projects. On a municipal level priority, synthetic evaluation of sector components for concerned municipalities (which is studied in the financial arrangements, Chapter 11) may be used for implementation arrangements.