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 are planned in almost the same manner as adopted in the 1998 Philippine National Development Plan (PNDP) and the National Sector Master Plan (NSMP), Medium-Term Investment covering the years 2000 to 2004 and Long-Term Development covering the period 2005 to 2010.

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. Provincial population by target year and the base year (1998) is estimated referring to the NSO population census results (past 10 census periods: 1903 - 1995), the 1995 Census-based National and Regional Population projection prepared by NSO, the 1995 Census-based Regional and Provincial Population projection prepared by the NEDA Regional Office VIII and the Provincial Physical Framework Plan/Comprehensive Provincial Land Use Plan. While, the population distribution to urban and rural areas prepared by NSO in 1995 is modified to meet actual conditions in the classification of the areas.

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 2004 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).

Table 8.2.1 Provincial Sector Targets

Sub-sectors	Base Year Service Coverage	Phase I (2000-2004)		Phase II (2005-2010)	
Water Supply	Population Coverage (%)	Population Coverage (%)	Additional Population to be Served	Population Coverage (%)	Additional Population to be Served
Urban Area	76	76	57,200	95	165,446
Rural Area	59	62	12,016	93	114,729
Sanitation	Household Coverage (%)	Household Coverage (%)	Additional Households to be Served	Household Coverage (%)	Additional Households to be Served
Household Toilet					
Urban Area	42	68	21,895	93	35,717
Flush	7	15	4,901	50	32,216
Pour Flush	86	75	14,256	50	3,501
VIP	7	10	2,738	0	0
Rural Area	31	50	11,767	68	25,790
Flush	0	0	0	10	1,815
Pour Flush	68	75	10,257	90	23,975
VIP	32	25	1,510	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
	45	70	46,184	90	41,677
Public Toilet	Public Utilities Coverage (%)	Public Utilities Coverage (%)	Additional Public Utilities with Sanitary Toilets	Public Utilities Coverage (%)	Additional Public Utilities with Sanitary Toilets
	100	100	1	100	0
Sewerage	Urban Population Coverage (%)	Not Applicable		Urban Population Coverage (%)	Urban Population to be Served
	0			50	132,530
Solid Waste	Urban Household Coverage (%)	Urban Household Coverage (%)	Additional Urban Households to be Served	Not Applicable	
	No data	50	30,170		

Table 8.2.2 Estimation of Base Year Service Coverage of Water Supply

Name of Municipality/ City	Area	Population (1998)	Population Served by 1998 Facilities				
			Level III	Level II	Level I	Total	Percentage Coverage
Almagro	Urban	321		222		222	69
	Rural	10,503		1,908	6,366	8,274	79
	Total	10,824		2,130	6,366	8,496	78
Basey	Urban	11,078	3,957	589	3,350	7,896	71
	Rural	29,356	6,767	1,083	8,337	16,187	55
	Total	40,434	10,724	1,672	11,687	24,083	60
Calbayog City	Urban	73,851	39,358	1,729	18,417	59,504	81
	Rural	59,891	12,588	7,944	22,047	42,579	71
	Total	133,742	51,946	9,673	40,464	102,083	76
Calbiga	Urban	3,930	3,567			3,567	91
	Rural	14,452	5,384		4,799	10,183	70
	Total	18,382	8,951		4,799	13,750	75
Catbalogan (Capital)	Urban	55,487	32,979	365	14,834	48,178	87
	Rural	22,753	2,588	1,033	7,442	11,063	49
	Total	78,240	35,567	1,398	22,276	59,241	76
Daram	Urban	11,066		1,434	5,359	6,793	61
	Rural	23,469		2,445	14,394	16,839	72
	Total	34,535		3,879	19,753	23,632	68
Gandara	Urban	5,303		210	3,076	3,286	62
	Rural	23,135			13,371	13,371	58
	Total	28,438		210	16,447	16,657	59
Hinabangan	Urban	5,216	4,799			4,799	92
	Rural	7,015			4,408	4,408	63
	Total	12,231	4,799		4,408	9,207	75
Jiabong	Urban	3,944	3,634			3,634	92
	Rural	12,435		1,526	4,829	6,355	51
	Total	16,379	3,634	1,526	4,829	9,989	61
Marabut	Urban	1,309		171	585	756	58
	Rural	8,984		1,482	2,991	4,473	50
	Total	10,293		1,653	3,576	5,229	51
Matuguinao	Urban	2,431		610	1,411	2,021	83
	Rural	3,228			955	955	30
	Total	5,659		610	2,366	2,976	53
Motiong	Urban	4,766		1,404	2,329	3,733	78
	Rural	8,759			4,981	4,981	57
	Total	13,525		1,404	7,310	8,714	64
Pagsanghan	Urban	1,124			648	648	58
	Rural	6,652			3,981	3,981	60
	Total	7,776			4,629	4,629	60
Paranas (Wright)	Urban	8,887	2,540	1,282	2,001	5,823	66
	Rural	15,850	370	2,116	5,702	8,188	52
	Total	24,737	2,910	3,398	7,703	14,011	57

Table 8.2.2 Estimation of Base Year Service Coverage of Water Supply

(cont'd)

Name of Municipality/City	Area	Population (1998)	Population Served by 1998 Facilities				
			Level III	Level II	Level I	Total	Percentage Coverage
Pinabacdao	Urban	1,154			742	742	64
	Rural	10,838			7,503	7,503	69
	Total	11,992			8,245	8,245	69
San Jorge	Urban	2,271		422		422	19
	Rural	10,261		1,145	6,106	7,251	71
	Total	12,532		1,567	6,106	7,673	61
San Jose De Buan	Urban	2,130		479	1,135	1,614	76
	Rural	3,751			509	509	14
	Total	5,881		479	1,644	2,123	36
San Sebastian	Urban	1,947			419	419	22
	Rural	4,646			2,589	2,589	56
	Total	6,593			3,008	3,008	46
Santa Margarita	Urban	13,467			11,019	11,019	82
	Rural	6,421			1,374	1,374	21
	Total	19,888			12,393	12,393	62
Santa Rita	Urban	11,417		920	6,899	7,819	68
	Rural	18,733		667	10,646	11,313	60
	Total	30,150		1,587	17,545	19,132	63
Santo Niño	Urban	2,728		332	477	809	30
	Rural	10,366		917	4,411	5,328	51
	Total	13,094		1,249	4,888	6,137	47
Tagapul-An	Urban	1,493			789	789	53
	Rural	6,845		587	4,119	4,706	69
	Total	8,338		587	4,908	5,495	66
Talalora	Urban	2,165		75	1,226	1,301	60
	Rural	4,548		351	3,474	3,825	84
	Total	6,713		426	4,700	5,126	76
Tarangnan	Urban	3,258			1,621	1,621	50
	Rural	16,481		458	10,043	10,501	64
	Total	19,739		458	11,664	12,122	61
Villareal	Urban	3,436		160	1,076	1,236	36
	Rural	19,141		238	3,167	3,405	18
	Total	22,577		398	4,243	4,641	21
Zumarraga	Urban	1,265			953	953	75
	Rural	13,627			10,756	10,756	79
	Total	14,892			11,709	11,709	79
Provincial Total	Urban	235,444	90,834	10,404	78,366	179,604	76
	Rural	372,140	27,697	23,900	169,300	220,897	59
	Total	607,584	118,531	34,304	247,666	400,501	66

The base year service coverage in urban area (76%) is higher than the updated MTPDP sector target (69%) for the year 1998, while rural area (59%) is behind the sector target of 79%.

For Phase I development, targets of service coverage for water supply by urban and rural area 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 existing76% shall be kept for urban and rural area. While 62% (3% increase from the base year service coverage) shall be set up for rural area.

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 35%, which is very much below the current national average coverage of 60%. Urban area registers a level of 42% that is well below the national average coverage. While rural area has only 31% owing to the presence of numerous unsanitary facilities. By type of sanitary toilet facility, the existing percentage composition to total households is as follows:

Type	Urban (%)	Rural (%)
Flush	7	0
Pour-flush	86	68
VIP latrine	7	32

To attain sufficiency and equitable access to basic services, provincial target of Phase I for urban household toilets is planned at 68%, while, for rural household toilets, 50% is projected. This is a little higher than the existing urban service coverage of 42% that is pursued to lessen the gap of the coverage between the urban and rural

cas 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 for urban household toilets, while, 68% is arranged for rural household toilets.

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
Almagro	Urban	321	65		25	2	27	135		38	3	42
	Rural	10,503	2,092		439	209	648	3,256		21	10	31
	Total	10,824	2,157		464	211	675	3,391		22	10	31
Basey	Urban	11,078	2,261	90	791	68	949	4,653	1	35	3	42
	Rural	29,356	6,233		1,309	623	1,932	9,101		21	10	31
	Total	40,434	8,494	90	2,100	691	2,881	13,754	1	25	8	34
Calbayog City	Urban	73,851	14,312	572	5,009	429	6,010	31,018	1	35	3	42
	Rural	59,891	12,173		2,556	1,217	3,773	18,567		21	10	31
	Total	133,742	26,485	572	7,565	1,646	9,783	49,585	2	29	6	37
Calbiga	Urban	3,930	763	31	267	23	321	1,651	4	35	3	42
	Rural	14,452	2,961		622	296	918	4,481		21	10	31
	Total	18,382	3,724	31	889	319	1,239	6,132	1	24	9	33
Catbalogan	Urban	55,487	10,609	424	3,713	318	4,455	23,305	4	35	3	42
	Rural	22,753	4,409		926	441	1,367	7,051		21	10	31
	Total	78,240	15,018	424	4,639	759	5,822	30,359	3	31	5	39
Daram	Urban	11,066	1,969		768	59	827	4,648		39	3	42
	Rural	23,469	4,462		937	446	1,383	7,276		21	10	31
	Total	34,535	6,431		1,705	505	2,210	11,924		27	8	34
Gandara	Urban	5,303	1,012		395	30	425	2,228		39	3	42
	Rural	23,135	4,674		982	467	1,449	7,172		21	10	31
	Total	28,438	5,686		1,377	497	1,874	9,400		24	9	33
Hinabangan	Urban	5,216	931	37	326	28	391	2,191	4	35	3	42
	Rural	7,015	1,257		264	126	390	2,175		21	10	31
	Total	12,231	2,188	37	590	154	781	4,366	2	27	7	36
Jiabong	Urban	3,944	699	28	245	21	294	1,657	4	35	3	42
	Rural	12,435	2,320		487	232	719	3,855		21	10	31
	Total	16,379	3,019	28	732	253	1,013	5,512	1	24	8	34
Marabut	Urban	1,309	268		105	8	113	550		39	3	42
	Rural	8,984	1,762		370	176	546	2,786		21	10	31
	Total	10,293	2,030		475	184	659	3,336		23	9	32
Matuguinao	Urban	2,431	438		171	13	184	1,022		39	3	42
	Rural	3,228	594		125	59	184	1,001		21	10	31
	Total	5,659	1,032		296	72	368	2,023		29	7	36
Motiong	Urban	4,766	883		344	26	370	2,002		39	3	42
	Rural	8,759	1,681		353	168	521	2,716		21	10	31
	Total	13,525	2,564		697	194	891	4,718		27	8	35
Pagsanghan	Urban	1,124	225		88	7	95	473		39	3	42
	Rural	6,652	1,196		251	120	371	2,063		21	10	31
	Total	7,776	1,421		339	127	466	2,536		24	9	33
Paranas	Urban	8,887	1,726	69	604	52	725	3,733	4	35	3	42
	Rural	15,850	3,060		643	306	949	4,914		21	10	31
	Total	24,737	4,786	69	1,247	358	1,674	8,647	1	26	7	35
Pinabacdao	Urban	1,154	215		84	6	90	485		39	3	42
	Rural	10,838	2,121		445	212	657	3,360		21	10	31
	Total	11,992	2,336		529	218	747	3,845		23	9	32
San Jorge	Urban	2,271	404		158	12	170	954		39	3	42
	Rural	10,261	2,060		433	206	639	3,181		21	10	31
	Total	12,532	2,464		591	218	809	4,135		24	9	33

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 Jose De Buan	Urban	2,130	445		174	13	187	895		39	3	42
	Rural	3,751	800		168	80	248	1,163		21	10	31
	Total	5,881	1,245		342	93	435	2,058		27	7	35
San Sebastian	Urban	1,947	362		141	11	152	818		39	3	42
	Rural	4,646	927		195	93	288	1,441		21	10	31
	Total	6,593	1,289		336	104	440	2,259		26	8	34
Santa Margarita	Urban	13,467	2,777		1,083	83	1,166	5,657		39	3	42
	Rural	6,421	1,269		266	127	393	1,991		21	10	31
	Total	19,888	4,046		1,349	210	1,559	7,648		33	5	39
Santa Rita	Urban	11,417	2,297		896	69	965	4,796		39	3	42
	Rural	18,733	3,645		765	365	1,130	5,808		21	10	31
	Total	30,150	5,942		1,661	434	2,095	10,604		28	7	35
Santo Niño	Urban	2,728	576		225	17	242	1,146		39	3	42
	Rural	10,366	2,094		440	209	649	3,214		21	10	31
	Total	13,094	2,670		665	226	891	4,360		25	8	33
Tagapul-An	Urban	1,493	345		135	10	145	628		39	3	42
	Rural	6,845	1,342		282	134	416	2,122		21	10	31
	Total	8,338	1,687		417	144	561	2,750		25	9	33
Talalora	Urban	2,165	433		169	13	182	910		39	3	42
	Rural	4,548	844		177	84	261	1,410		21	10	31
	Total	6,713	1,277		346	97	443	2,320		27	8	35
Tarangnan	Urban	3,258	643		251	19	270	1,369		39	3	42
	Rural	16,481	3,238		680	324	1,004	5,110		21	10	31
	Total	19,739	3,881		931	343	1,274	6,479		24	9	33
Villareal	Urban	3,436	643		251	19	270	1,444		39	3	42
	Rural	19,141	3,625		761	363	1,124	5,934		21	10	31
	Total	22,577	4,268		1,012	382	1,394	7,378		24	9	33
Zumarraga	Urban	1,265	235		92	7	99	532		39	3	42
	Rural	13,627	2,552		536	255	791	4,225		21	10	31
	Total	14,892	2,787		628	262	890	4,757		23	9	32
Provincial Total	Urban	235,444	45,536	1,251	16,510	1,363	19,124	98,900	3	36	3	42
	Rural	372,140	73,391		15,412	7,338	22,750	115,376		21	10	31
	Total	607,584	118,927	1,251	31,922	8,701	41,874	214,276	1	27	7	35

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) are 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 8.2.4 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 (%)
Almagro	2,110	1,360	64			
Basey	9,582	3,600	38			
Calbayog City	29,438	1,640	6	12	12	100
Calbiga	4,459	3,280	74			
Catbalogan (Capital)	19,431	7,880	41	1	1	100
Daram	7,081	4,560	64			
Gandara	5,698	3,810	67	1	1	100
Hinabangan	3,080	1,520	49			
Jiabong	3,005	2,240	75			
Marabut	2,710	1,040	38			
Matuguinao	736	560	76			
Motiong	3,211	2,560	80			
Pagsanghan	1,670	960	57			
Paranas (Wright)	6,812	3,600	53			
Pinabacdao	2,896	1,840	64			
San Jorge	2,183	1,200	55			
San Jose De Buan	918	918	100			
San Sebastian	1,496	720	48			
Santa Margarita	3,738	2,760	74			
Santa Rita	5,670	3,600	63			
Santo Niño	2,850	1,200	42			
Tagapul-An	1,806	1,120	62			
Talalora	1,684	800	48			
Tarangnan	4,137	3,010	73			
Villareal	5,954	2,640	44			
Zumarraga	2,792	1,760	63			
Provincial Total	135,147	60,238	45	14	14	100

Base year service coverage is 45% 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).

All existing public utilities are served with at least one sanitary toilet giving 100% coverage. This can be attributed by the fact that 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 indicates only the municipalities that have municipal collection system and the corresponding number of refuse collection truck. There are no available data on the number of households served by the municipal refuse collection and the manner of disposal.

The municipalities have a total of 10 units of collection truck.

No national targets have yet been set. In the absence of data on the existing urban household coverage, a 50% urban household coverage is applied for the medium-term period (2000-2004).

8.3 Projection of Frame Values

8.3.1 Review of Past Population Development and Population Projection

Future population for all municipalities by urban and rural areas was projected for the target years 2004 and 2010 together with the present population in 1998 as a planning base year.

Future regional population is published by the NSO, while projections at the provincial and the municipal levels were not available during the study. On the other hand, the NEDA Regional Office VIII projected the regional and provincial population for year 2006. 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 1903 to 1995
- 1995 Census-based National and Regional Population Projection prepared by the NSO
- 1995 Census-based Regional and Provincial Population Projection prepared by the NEDA Regional Office-VIII
- Provincial Physical Framework Plan/Comprehensive Provincial Land Use Plan (1993-2002) prepared by the Provincial Office

(1) Comparison of regional population projected by NSO and NEDA

The NSO conducted the national population projections for the period 1995-2040 and the regional 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.

In the regional population projection, Region VIII is classified as medium-sized region.

On the other hand, the NEDA Regional Office-VIII projected the regional population together with the provincial population for year 2006 based on the 1995 census result.

Comparing the projected population by NSO with the NEDA projection, the latter is rather conservative, which reflects the past trend.

Table 8.3.1 Comparison of Regional Population Projection by the NSO and NEDA

Year		1980	1990	1995	2000	2005	2010
Census	Population	2,799,534	3,054,490	3,366,917			
	Growth Rate		0.88%	1.97%			
NSO Projection	Population			3,356,854	3,743,895	4,132,242	4,523,762
	Growth Rate				2.21%	2.00%	1.82%
NEDA Projection	Population			3,366,917	3,538,664	3,719,171	
	Growth Rate				1.00%	1.00%	

Note: The 1995 population as of July 1995 was used as a basis for NSO population projection.
NEDA projections in 2000 and 2005 are estimated in this study.

(2) Provincial Physical Framework Plan/Comprehensive Provincial Land Use Plan (1993-2002)

The provincial and municipal population for the year 2002 was projected with 1990 as the base year. The population growth rates by municipality experienced between 1980 and 1990 were basically adopted for the projection. The provincial growth rate was 0.63% between1980 and 1990. While the experienced and projected growth rates of Region VIII were 0.88 % between 1980 and 1990 and 0.95 % between 1990 and 2002.

The population projection on the provincial total and component municipalities was made with 1990 as a base year. 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).

Comparing the census and the projected population in 1995, the provincial population based on the census was about 7% higher than the projected. Regarding the municipal census population in 1995, nineteen (19) out of 26 municipalities were higher with a range of 4 to 56% comparing with the projected figures, while the remaining seven (7) municipalities were lower.

In addition to this, the province is presently updating their Land Use Plan using the NEDA projection based on 1995 census population. Thus, the future projection shall be made using the 1995 census results as a base year.

(3) Population Projection of the Province

The following conditions are considered in the population projection.

Regional Population

For the regional population in the study, the projection conducted by NEDA regional office may be adopted assuming that rather conservative population growth will be realized comparing with NSO projection.

1) The regional population projected by the NEDA for the year 2006 is referred to for the short and medium-term periods. The annual growth rate of 1.00% between 1995 and 2006 will be adopted for the projection in 1998 and 2004 using the compounded formula as a base year 1995.

2) For the long-term projection, it is assumed that the annual growth rates will decrease gradually as adopted in the NSO projection. The annual growth rates adopted in NSO projection decline from 2.00% (2000 - 2005) to 1.82% (2005 - 2010), which indicate that the relative reduction rate is 0.09%. In this study, the same reduction rate may be used to the NEDA projected growth rate of 1.00% (2000 - 2005). Thus, the population in year 2010 is estimated at 3,891,501 applying the growth rate of 0.91% from year 2005. The growth rates adopted in the study correspond to half the figures employed by NSO.

Year	Population	Growth Rate
1995	3,366,917	Census result
1998	3,468,938	1.00% (1995 - 1998)
2004	3,682,348	1.00% (1995 - 2004)
2005	3,719,171	1.00% (1995 - 2005)
2010	3,891,501	0.91% (2005 - 2010)

Provincial Population

In the NEDA projection, the regional population to be increased from 1995 to 2006 was distributed to each province in proportion to the share of the provincial population increase to the regional population experienced between 1990 and 1995. In this study, it is assumed that the tendency of the population growth by province will not drastically change. Thus, the same manner as adopted by the NEDA projection was employed both for short/medium-term and long-term period in the population distribution from the regional population to those for concerned provinces. The distribution of the regional population to be increased to the provincial population was made between the respective base/target years. Table 8.3.2 shows the projected population in year 1998, 2004 and 2010 together with the NEDA projection.

Table 8.3.2 Projected Population of the Provinces

Province	NEDA Projection				Projected Population		
	Population		Population Increase				
	1995	2006	Number	Share	1998	2004	2010
Biliran	132,209	149,921	17,712	4.55%	136,851	146,561	156,977
Eastern Samar	362,324	403,509	41,185	10.58%	373,118	395,697	417,825
Leyte	1,511,251	1,689,501	178,250	45.79%	1,557,966	1,655,686	1,751,458
Northern Samar	454,195	542,288	88,093	22.63%	477,282	525,577	572,908
Samar	589,373	658,859	69,486	17.85%	607,584	645,678	683,012
Southern Leyte	317,565	312,115	-5,450	-1.40%	316,137	313,149	310,221
Region	3,366,917	3,756,193	389,276	100.00%	3,468,938	3,682,348	3,891,501

Municipal Population

1) The total population of the province in 1998, 2004 and 2010 was fixed.
2) For the population projection by municipality, the same method employed in NEDA projection for the distribution of regional population to provincial population was applied. The provincial population to be increased in respective planning years was distributed to each municipality in proportion to the share of the population increase of each municipality to the provincial total experienced between 1990 and 1995. Table 8.3.3 presents the census results (1990 and 1995) and the projected population of

the municipalities.

Table 8.3.3 Census Results and Projected Population of Municipalities

Municipality/ City	Census Result				Projected Population					
	1990	1995	Pop. Growth	Share to Provincial Pop. Growth	1998		2004		2010	
					Population	GR	Population	GR	Population	GR
Almagro	8,578	10,270	1,692	3.0%	10,824	1.77%	11,982	1.71%	13,117	1.52%
Basey	39,137	40,114	977	1.8%	40,434	0.27%	41,103	0.27%	41,759	0.26%
Calbayog City	115,390	129,216	13,826	24.8%	133,742	1.15%	143,209	1.15%	152,487	1.05%
Calbiga	17,116	18,070	954	1.7%	18,382	0.57%	19,035	0.58%	19,675	0.55%
Catbalogan	70,470	76,324	5,854	10.5%	78,240	0.83%	82,248	0.84%	86,176	0.78%
Daram	31,332	33,745	2,413	4.3%	34,535	0.77%	36,187	0.78%	37,806	0.73%
Gandara	23,673	27,263	3,590	6.5%	28,438	1.42%	30,896	1.39%	33,305	1.26%
Hinabangan	11,906	12,151	245	0.4%	12,231	0.22%	12,399	0.23%	12,563	0.22%
Jiabong	12,751	15,484	2,733	4.9%	16,379	1.89%	18,250	1.82%	20,084	1.61%
Marabut	10,543	10,355	-188	-0.3%	10,293	-0.20%	10,164	-0.21%	10,038	-0.21%
Matuguinao	3,819	5,205	1,386	2.5%	5,659	2.83%	6,608	2.62%	7,538	2.22%
Motiong	12,115	13,177	1,062	1.9%	13,525	0.87%	14,252	0.88%	14,965	0.82%
Pagsanghan	6,047	7,350	1,303	2.3%	7,776	1.90%	8,668	1.83%	9,542	1.61%
Paranas	22,702	24,235	1,533	2.8%	24,737	0.69%	25,787	0.70%	26,816	0.65%
Pinabacdao	10,361	11,590	1,229	2.2%	11,992	1.14%	12,833	1.14%	13,658	1.01%
San Jorge	10,111	11,935	1,824	3.3%	12,532	1.64%	13,781	1.60%	15,005	1.43%
San Jose De Buan	4,217	5,471	1,254	2.3%	5,881	2.44%	6,740	2.30%	7,581	1.98%
San Sebastian	5,732	6,381	649	1.2%	6,593	1.10%	7,037	1.09%	7,472	1.00%
Santa Margarita	16,878	19,146	2,268	4.1%	19,888	1.28%	21,441	1.26%	22,963	1.15%
Santa Rita	25,202	28,930	3,728	6.7%	30,150	1.39%	32,702	1.36%	35,203	1.24%
Santo Niño	11,743	12,761	1,018	1.8%	13,091	0.86%	13,791	0.87%	14,474	0.81%
Tagapul-An	6,760	7,949	1,189	2.1%	8,338	1.61%	9,152	1.56%	9,950	1.40%
Talalora	6,112	6,565	453	0.8%	6,713	0.75%	7,023	0.76%	7,327	0.71%
Tarangnan	15,894	18,791	2,897	5.2%	19,739	1.65%	21,722	1.61%	23,666	1.41%
Villareal	21,820	22,390	570	1.0%	22,577	0.28%	22,967	0.29%	23,349	0.28%
Zumarraga	13,324	14,505	1,181	2.1%	14,892	0.88%	15,701	0.89%	16,493	0.82%
Province	533,733	589,373	55,640	100.0%	607,584	1.02%	645,678	1.02%	683,012	0.94%

Note: Growth rates in 1998, 2004 and 2010 were calculated using compounded formula.

Population by Urban and Rural Area

1) Past population development

With regards to the ratio of the urban population of the province to the total population, the provincial averages in 1980 and 1990 were 14.6% and 25.5%, likewise it increased to 35.1% in 1995. The provincial growth rate of 6.43% between 1980 and 1990 increased to 8.73% in 1995. While, growth rates of the rural population by municipality have been kept on the same level: -0.74% (1980 - 1990) and -0.77% (1990 - 1995) as a provincial average.

2) Projection of urban and rural population for the years 1998, 2004 and 2010

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

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

- Short/Medium-term target: 1998 and 2004

  Growth rates between 1990 and 1995 in terms of the profile of urban population to total population by municipality were basically adopted. Rural population was calculated to meet total population by fixing the urban population. However, for the municipalities having drastic changes of growth rates between two census periods (1990 - 1995 and 1980 - 1990): the average growth rates of the urban population between 1980 and 1995 were employed. These municipalities are Calbiga, Gandara, Paranas, Sta. Rita and Tarangnan.

  In addition, some modifications were made as follows:

  - Municipalities of Matuguinao, Motiong, San Jorge and Tagapul-an: There are no available data on the 1980 urban population of these municipalities. Thus, the rural population in 1995 was fixed and the urban population was calculated to meet the total population.
  - Catbalogan and Daram municipalities: By applying the high growth rates (more than 10%) between 1990 and 1995, the rural population will become negative figures. Thus, the 1995 rural population was fixed and the urban population was calculated to meet the total population
  - Municipalities of Almagro and Marabut: The urban population in 1995 was fixed for the short/medium-term to avoid a negative growth of the urban population.
- Long-term target: 2010

  For the long-term projection, the share of urban/rural population in 2004 may be applied for the municipal population in 2010 assuming that the adopted share of urban/rural population in the medium-term period will not drastically change.

Under the above assumptions, the provincial average share of the urban population for the year 2010 was arrived at 48.3%, higher than the figures in 1995 (35.1%) and 1990 (25.5%). Table 8.3.4 presents the projected urban and rural population. The growth rates and shares on rural population are calculated using the estimated urban population.

Table 8.3.4 Population Projection by Urban and Rural Area:1998, 2004 and 2010

	Municipality/City	1998				2004				2010			
		Total	Urban/ Rural	G.R. (%)	Share (%)	Total	Urban/ Rural	G.R. (%)	Share (%)	Total	Urban/ Rural	G.R. (%)	Share (%)
Urban Area	Almagro	10,824	321	0.00%	3.0%	11,982	321	0.00	2.7%	13,117	351	1.50%	2.7%
	Basey	40,434	11,078	1.29%	27.4%	41,103	11,961	1.29	29.1%	41,759	12,152	0.26%	29.1%
	Calbayog City	133,742	73,851	8.38%	55.2%	143,209	119,709	8.38	83.6%	152,487	127,465	1.05%	83.6%
	Calbiga	18,382	3,930	3.28%	21.4%	19,035	4,772	3.29	25.1%	19,675	4,932	0.55%	25.1%
	Catbalogan	78,240	55,487	1.18%	70.9%	82,248	59,495	1.17	72.3%	86,176	62,336	0.78%	72.3%
	Daram	34,535	11,066	2.50%	32.0%	36,187	12,718	2.35	35.1%	37,806	13,287	0.73%	35.1%
	Gandara	28,438	5,303	5.04%	18.6%	30,896	7,121	5.04	23.0%	33,305	7,676	1.26%	23.0%
	Hinabangan	12,231	5,216	2.65%	42.6%	12,399	6,100	2.61	49.2%	12,563	6,181	0.22%	49.2%
	Jiabong	16,379	3,944	2.77%	24.1%	18,250	4,647	2.77	25.5%	20,084	5,114	1.61%	25.5%
	Marabut	10,293	1,309	0.00%	12.7%	10,164	1,309	0.00	12.9%	10,038	1,309	0.00%	13.0%
	Matuguinao	5,659	2,431	7.13%	43.0%	6,608	3,380	5.65	51.2%	7,538	3,856	2.22%	51.2%
	Motiong	13,525	4,766	2.56%	35.2%	14,252	5,493	2.39	38.5%	14,965	5,768	0.82%	38.5%
	Pagsanghan	7,776	1,124	7.29%	14.5%	8,668	1,715	7.30	19.8%	9,542	1,888	1.61%	19.8%
	Paranas	24,737	8,887	6.17%	35.9%	25,787	12,728	6.17	49.4%	26,816	13,236	0.65%	49.4%
	Pinabacdao	11,992	1,154	0.79%	9.6%	12,833	1,210	0.79	9.4%	13,658	1,288	1.05%	9.4%
	San Jorge	12,532	2,271	10.70	18.1%	13,781	3,520	7.58	25.5%	15,005	3,833	1.43%	25.5%
	San Jose de Buan	5,881	2,130	4.29%	36.2%	6,740	2,741	4.29	40.7%	7,581	3,083	1.98%	40.7%
	San Sebastian	6,593	1,947	3.62%	29.5%	7,037	2,410	3.62	34.2%	7,472	2,559	1.00%	34.2%
	Santa Margarita	19,888	13,467	3.82%	67.7%	21,441	16,868	3.83	78.7%	22,963	18,065	1.15%	78.7%
	Santa Rita	30,150	11,417	7.07%	37.9%	32,702	17,200	7.07	52.6%	35,203	18,515	1.24%	52.6%
	Santo Niño	13,094	2,728	2.07%	20.8%	13,791	3,087	2.08	22.4%	14,474	3,240	0.81%	22.4%
	Tagapul-an	8,338	1,493	10.59	17.9%	9,152	2,307	7.52	25.2%	9,950	2,508	1.40%	25.2%
	Tafalora	6,713	2,165	0.50%	32.3%	7,023	2,230	0.49	31.8%	7,327	2,327	0.71%	31.8%
	Tarangnan	19,739	3,258	2.16%	16.5%	21,722	3,702	2.15	17.0%	23,666	4,033	1.44%	17.0%
	Villareal	22,577	3,436	0.51%	15.2%	22,967	3,543	0.51	15.4%	23,349	3,602	0.28%	15.4%
	Zumarraga	14,892	1,265	0.40%	8.5%	15,701	1,296	0.40	8.3%	16,493	1,361	0.82%	8.3%
	Province	607,584	235,444	4.43	38.8%	645,678	311,583	4.78	48.3%	683,012	329,965	0.96%	48.3%
Rural Area	Almagro	10,824	10,503	1.82%	97.0%	11,982	11,661	1.76	97.3%	13,117	12,766	1.52%	97.3%
	Basey	40,434	29,356	-	72.6%	41,103	29,142	-	70.9%	41,759	29,607	0.26%	70.9%
	Calbayog City	133,742	59,891	-	44.8%	143,209	23,500	-	16.4%	152,487	25,022	1.05%	16.4%
	Calbiga	18,382	14,452	-	78.6%	19,035	14,263	-	74.9%	19,675	14,743	0.55%	74.9%
	Catbalogan	78,240	22,753	0.00%	29.1%	82,248	22,753	0.00	27.7%	86,176	23,840	0.78%	27.7%
	Daram	34,535	23,469	0.00%	68.0%	36,187	23,469	0.00	64.9%	37,806	24,519	0.73%	64.9%
	Gandara	28,438	23,135	0.65%	81.4%	30,896	23,775	0.46	77.0%	33,305	25,629	1.26%	77.0%
	Hinabangan	12,231	7,015	-	57.4%	12,399	6,299	-	50.8%	12,563	6,382	0.22%	50.8%
	Jiabong	16,379	12,435	1.62%	75.9%	18,250	13,603	1.51	74.5%	20,084	14,970	1.61%	74.5%
	Marabut	10,293	8,984	-	87.3%	10,164	8,855	-	87.1%	10,038	8,729	-	87.0%
	Matuguinao	5,659	3,228	0.00%	57.0%	6,608	3,228	0.00	48.8%	7,538	3,682	2.22%	48.8%
	Motiong	13,525	8,759	0.00%	64.8%	14,252	8,759	0.00	61.5%	14,965	9,197	0.82%	61.5%
	Pagsanghan	7,776	6,652	1.09%	85.5%	8,668	6,953	0.74	80.2%	9,542	7,654	1.61%	80.2%
	Paranas	24,737	15,850	-	64.1%	25,787	13,059	-	50.6%	26,816	13,580	0.65%	50.6%
	Pinabacdao	11,992	10,838	1.18%	90.4%	12,833	11,623	1.17	90.6%	13,658	12,370	1.04%	90.6%
	San Jorge	12,532	10,261	0.00%	81.9%	13,781	10,261	0.00	74.5%	15,005	11,172	1.43%	74.5%
	San Jose de Buan	5,881	3,751	1.43%	63.8%	6,740	3,999	1.07	59.3%	7,581	4,498	1.98%	59.3%
	San Sebastian	6,593	4,646	0.11%	70.5%	7,037	4,627	-	65.8%	7,472	4,913	1.00%	65.8%
	Santa Margarita	19,888	6,421	-	32.3%	21,441	4,573	-	21.3%	22,963	4,898	1.15%	21.3%
	Santa Rita	30,150	18,733	-	62.1%	32,702	15,502	-	47.4%	35,203	16,688	1.24%	47.4%
	Santo Niño	13,094	10,366	0.55%	79.2%	13,791	10,704	0.54	77.6%	14,474	11,234	0.81%	77.6%
	Tagapul-an	8,338	6,845	0.00%	82.1%	9,152	6,845	0.00	74.8%	9,950	7,442	1.40%	74.8%
	Tafalora	6,713	4,548	0.86%	67.7%	7,023	4,793	0.88	68.2%	7,327	5,000	0.71%	68.2%
	Tarangnan	19,739	16,481	1.56%	83.5%	21,722	18,020	1.50	83.0%	23,666	19,633	1.44%	83.0%
	Villareal	22,577	19,141	0.24%	84.8%	22,967	19,421	0.24	84.6%	23,349	19,747	0.28%	84.6%
	Zumarraga	14,892	13,627	0.93%	91.5%	15,701	14,405	0.93	91.7%	16,493	15,132	0.82%	91.7%
	Province	607,584	372,140	-	61.2%	645,678	334,095	-	51.7%	683,012	353,047	0.92%	51.7%

Note: G.R. - Growth Rate

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 5% from the 1998 rate is foreseen in 2004 and another increase of 2% from the 2004 rate in 2010 (details are referred to Table 8.3.6, Supporting Report).

Table 8.3.5 shows the projected number of public school students by municipality, by target year. About 245,000 and 258,000 public school students are estimated to enroll for years 2004 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.

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	2004	2010	1998	2004	2010
Almagro	2,110	2,552	2,957			
Basey	9,582	10,377	10,542	2	2	2
Calbayog City	29,438	33,415	35,580	5	5	5
Calbiga	4,459	4,993	5,161	3	3	3
Catbalogan (Capital)	19,431	20,620	21,605	5	6	6
Daram	7,081	7,883	8,785			
Gandara	5,698	6,830	7,718	1	1	1
Hinabangan	3,080	3,370	3,414	2	2	2
Jiabong	3,005	3,762	4,416	2	2	2
Marabut	2,710	2,742	2,708	1	1	1
Matuguinao	736	944	1,175	1	1	1
Motiong	3,211	3,672	4,070	1	1	1
Pagsanghan	1,670	2,028	2,356	1	1	1
Paranas (Wright)	6,812	7,054	7,335	2	2	2
Pinabacdao	2,896	3,266	3,669	1	1	1
San Jorge	2,183	2,531	2,952	2	2	2
San Jose De Buan	918	1,291	1,452	1	1	1
San Sebastian	1,496	1,683	1,787	2	2	2
Santa Margarita	3,738	4,333	4,950	2	2	2
Santa Rita	5,670	6,921	7,947	1	1	1
Santo Niño	2,850	3,213	3,560			
Tagapul-An	1,806	2,196	2,520			
Talalora	1,684	1,842	1,922	1	1	1
Tarangnan	4,137	5,109	5,894	1	1	1
Villareal	5,954	6,138	6,240	1	1	1
Zumarraga	2,792	3,266	3,612			
Provincial Total	135,147	152,031	164,327	38	39	39

Only one (1) public markets, bus/jeepney terminals and parks/playgrounds is planned for construction by year 2004 in Catbalogan and no planned construction by the 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).

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.

Seven (7) municipalities with a total urban population of about 132,530 are considered (refer to Table 8.5.5 for the urban population of concerned municipalities).

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

The number of urban households in 2004 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 PWASP.

8.4.1 Water Supply

The following are 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 first 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 a summary of the study results by municipality.

1) Review of existing water supply systems and water sources

The municipalities/city of Basey, Calbayog, Calbiga and Catbalogan are served by WDs. While the municipalities of Hinabangan, Jiabong and Paranas are served by Level III systems operated by the municipal government or local community. The population served by the Level III systems ranges from about 2,900 persons in Paranas to 52,000 persons in Calbayog City. The average size of served population is about 17,000 persons. Water sources of these systems are surface water and/ or spring sources.

Table 8.4.1 Summary of Urban Water Supply Development by Municipality

Municipality / City	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Almagro	Almagro is an island municipality. There is no Level III system at present. Urban population is about 500. Majority of the people uses Level II system in poblacion area.	None	Spring development is recommendable for future development of Level III water supply. Solo shallow well area covers this urban area, but production may be poor.	New system shall be created. Study on spring development is a requisite. Upgrading from existing Level II to Level III shall be considered.
Basey	There is a WD to cover 6 urban barangays with served population of 4,000 out of total urban population of 11,000. Others use Level I facilities and Level II systems. The WD is using surface water from Panlalawagan-loo River as a water source. Production amount is estimated at 700m3/d at present.	None	Present river water source is sufficient for urban water supply. Saline water intrusion is found in coastal area affecting groundwater development both for shallow and deep wells.	System expansion using present water source is required. Study on water treatment for turbid water during rain falls shall be conducted.
Calbayog City	There exists a Calbayog WD, the largest system in the province, covering 15 urban barangays with served population of about 40,000 (53% of urban population). Water source of the WD is surface water from Panas Fall with production capacity of about 4,500m3/d. Raw water is not treated except for chlorination at present. With regard to this, the WD is undertaking the construction of water treatment plant (capacity 17,000 m3/d) and new intake facility (6,000 m3/d).	On-going (construction of water treatment plant and expansion of its service area)	Acidic river water quality was reported in the F/S study conducted by LWUA in 1991. Groundwater development is risky because of ironic water quality problem.	Further expansion of the system is required. Study on pH adjustment shall be conducted.
Calbiga	There is a WD covering 6 urban barangays with served population of 3,600 (90% of urban population). The WD is using spring as a water source. Production of the system is estimated at 800m3/d at present. The WD has expansion program together with creating/merging water supply systems in three (3) municipalities of Pinabacdao, San Sebastian and Villareal. The concerned municipalities had agreed to set up a new water district this year with assistance from LWUA. Thus, LWUA will conduct F/S on the system in 2000.	Plan (expansion of service area to other 3 municipalities)	Spring is a favorable water source for integration of Level III water supply systems. Urban areas of municipalities of Calbiga, Pinabacdao, San Sebastian and Villareal are located in hillyside. Deep well has poor yields in this hilly area. High yielding deep well area is located in epast, but saline water intrusion was reported.	System expansion integrating other 3 municipalities is required. Financial source shall be secured.
Catbalogan (Capital)	Catbalogan WD, the second largest system in the province, is operated covering 16 urban and 1 rural barangays in the municipality with served population of 35,600 (60% of urban population). Water source is a combination of surface water, spring and deep well (2 units). Surface water originated from Kulador Lake is filtrated to produce 1,100m3/d. Discharge rates of spring source and deep wells are estimated at 900m3/d and 1,000m3/d. However, operation of one of the deep wells is suspended due to saline water intrusion. Thus, total production at present is estimated 2,300m3/d. Hence, the WD has a plan to develop a spring source located at Barangay Caramayon, 10 km away from poblacion area. The discharge rate is estimated at about 900m3/d.	None	A few spring sources with large yields (good for Level III water supply) exist in upstream area of Catbalogan. Deep well has a poor production capacity (estimated about 500 cu.m/d).	System expansion with additional water source development (spring) is required. Integration (neighboring 4 municipalities) shall be studied.

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

Municipality / City	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Daram	Daram is an island municipality. There is no Level III system at present. Urban population is about 11,000. They use Level I facilities and Level II systems.	None	Numerous springs are available in this area. But their yeilds are generally small. Spring fields shall be investigated including water quality examination.	New system shall be created. Study on spring development is a requisite.
Gandara	There is no Level III system at present. They use Level I facilities and Level II systems in urban area (5,300 population).	None	The spring is a priority source for the development of Level III water supply. High yielding deep well area is located along Gandara River, where the fluviatile deposits exists. The specifications of this deep well are depth of 40m and production capacity of 1,000 cu.m/d or more. Ironic groundwater is locally observed.	New system shall be created. Study on water source development (spring/deep well) is a requisite. Upgrading from existing Level II systems shall be studied.
Hinabangan	One Level III managed by the municipality exists. The system serves for 4,800 population (92% of urban population, 5,200, is served). Spring source is used for the water supply.	None	Additional springs can be developed for future expansion of Level III water supply.	System expansion with water source augmentation is required. Maintenance of existing system is also a requisite.
Jiabong	One Level III managed by the municipality exists. The system serves for 3,600 population (92% of urban population, 3,900, is served). A spring source is used for the water supply.	None	Additional springs can be developed for future expansion of Level III water supply.	Maintenance of the existing system is required. The study for integrated water supply system with neighboring municipalities is necessary.
Marabut	No Level III system exists at present. Urban population is about 1,300. They use Level I and II systems.	None	The spring is only potential water source for new establishment of Level III water supply.	New system shall be created with a due consideration of upgrading from existing Level II systems. Study on spring development is a requisite. Water quality examination of spring sources shall be conducted through the year.
Matuguinao	No Level III system exists at present. Urban population is about 2,400. They use Level I and II systems.	None	The spring is the only potential water source for the development of Level III water supply. Deep well development is risky for Level III water supply because of low yield (less than 500 cu.m/d) and low water table (lower than 40 mbgs). Groundwater quality problem of high iron contents is observed.	New system shall be created with a due consideration of upgrading from existing Level II systems. Study on spring development is a requisite.

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

Municipality / City	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Motiong	No Level III system exists at present. Urban population is about 2,800. They use Level I and II systems.	None	The spring is a priority water source for the development of Level III water supply. High yielding deep well area is located in seashore belt. of the deep well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d. Saline water intrusion is locally observed.	New system shall be created. Study on water source development (combination of spring and deep well)is a requisite.
Pagsanghan	There is no Level III system at present. Urban population is about 1,100. They use Level I facilities and Level II systems.	None	The spring is a priority water source for the development of Level III water supply. High yielding deep well area is located along Gandara River, where fluviatile deposits exist. The deep well specifications are: depth of 40m and production capacity of 1,000 cu.m/d or more. Ironic groundwater is locally observed.	New system shall be created. Study on water source development (deep well) is a requisite.
Paranas (Wright)	There is a combined system with communal faucets in provision of spring source. The WWs is managed by municipal government and it covers 6 urban barangays with served population of 3,800 (33% of urban population, 8,900, is served) including population served by communal faucets.	None	Additional springs can be developed for future expansion of Level III water supply. Water quality examination shall be conducted to confirm the contamination from mineral rich rock formations.	System expansion entailing water source augmentation and construction of aditional transmission pipeline is required. Study on the integration of neighboring municipalities shall be studied.
Pinabacdao	There is no Level III system in urban area (about 1,200 population) at present. However, the municipality of Pinabacdao is ready to create a Water District as an inter-municipality water supply system together with Calbiga WD, San Sebastian and Villareal.	Plan (creation of inter-municipality water supply system)	See Calbiga.	Inter-municipality water supply system together with Calbiga WD, San Sebastian and Villareal may be sought. Financial source shall be secured.
San Jorge	There is no Level III system at present. Urban population is about 2,300. They use Level I facilities and Level II systems.	None	The spring is a priority water source for the development of Level III water supply. High yielding deep well area is located along Gandara River, where fluviatile deposits exist. The deep well specifications are: depth of 40m and production capacity of 1,000 cu.m/d or more. Ironic groundwater is locally observed.	New system shall be created. Study on water source development (spring/deep well) is a requisite.
San Jose de Bua	There is no Level III system at present. Urban population is about 2,100. They use Level I facilities and Level II systems.	None	The pring is only potential water source for the development of Level III water supply.	New system shall be created. Study on water source development (spring) is a requisite. Water quality examination of spring sources shall be conducted throughout the year.

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

Municipality / City	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
San Sebastian	There is no Level III system in urban area (Population of 2,000). The municipality of San Sebastian is ready to create a Water District as an inter-municipality water supply system together with Calbiga WD, Pinabacdao and Villareal.	Plan (to be served by Calbiga WD)	See Calbiga.	Inter-municipality water supply system together with Calbiga WD, Pinabacdao and Villareal may be sought.
Santa Margarita	No Level III exists at present. Urban population is about 13,500. They use Level I facilities.	None	The spring is a priority water source for the development of Level III water supply. High yielding deep well area is located in seashore belt. The deep well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d. Saline water intrusion is locally observed.	New system shall be created. Study on water source development is a requisite. Study on integration with Calbayog City shall be also studied.
Santa Rita	There is no Level III system at present. Urban population is about 11,400. They use Level I facilities and Level II systems.	None	The spring is a priority water source for the developmen of Level III water supply. High yielding deep well area is located in seashore belt. The deep well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d. Saline water intrusion is locally observed.	New system shall be created. Study on water source development (spring/deepwell) is a requisite.
Santo Niño	Santo Nino is an island municipality. There is no Level III system at present. Urban population is about 2,700. They use Level I facilities and Level II systems.	None	Spring development is recommended for future establishment of Level III water supply. Solo shallow well area covers this urban area, but production amount is poor.	New system shall be created. Study on spring development is a requisite.
Tagapul-an	No Level III exists at present. Urban population is about 1,500. Majority of the people uses Level I facilities.	None	Spring development is recommended for future establishment of Level III water supply. Solo shallow well area covers this urban area, but production amount is poor.	New system shall be created. Study on spring development is a requisite
Talalora	No Level III exists at present. Urban population is about 2,200. They use Level I facilities and Level II systems	None	The spring is only potential water source for the development of Level III water supply	New system shall be created. Study on spring development is a requisite. Upgrading from existing Level II shall be considered.

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

Municipality / City	Existing Condition	On-going/Planned Project	Water Source Availability	Future Requirements
Tarangnan	There is no Level III system at present. Urban population is about 3,300. They use Level I facilities and Level II systems.	None	The spring is a priority water source for the development of Level III water supply. High yielding deep well area is located in seashore belt. The deep well specifications are: depth of 40m and production capacity of about 1,000 cu.m/d. Saline water intrusion is locally observed.	New system shall be created. Study on water source development (deep well) is a requisite. Integration of the system with Pagsanghan using deep well may be studied.
Villareal	There is no Level III at present. Urban population is about 3,400. They use Level I facilities and and Level II systems. The municipality of Villareal is ready to create a Water District as an inter-municipality water supply system together with Calbiga WD, Pinabacdao and San Sebastian.	Plan (to be served by Calbiga WD)	See Calbiga.	Inter-municipality water supply system together with Calbiga WD, Pinabacdao and San Sebastian shall be sought.
Zumarraga	Zumarranga is an island municipality. There is no Level III system at present. Urban population is about 1,300. They use Level I facilities.	None	Numerous springs are available in this area. But their yeilds are generally small. Spring fields shall be investigated with water quality examination.	New system shall be created. Study on spring development is a requisite.

The remaining 19 out of 26 municipalities/city have no Level III system in their urban areas and are presently served by Level II systems and/or Level I facilities.

Preference is made to utilize spring sources owing to less O&M activities and cost compared to deep well with electric motor pump.

2) Review of planned/on-going projects

At present, CalbigaWD has an expansion program together with creating/merging the water supply systems in three (3) municipalities of Pinabacdao, San Sebastian and Villareal. The concerned municipalities had already agreed to set up a new water district this year with the assistance of LWUA. With regard to this, LWUA is to conduct F/S on this matter in 2000. Also, Calbayog is currently constructing a water treatment plant (capacity 17,000 m^3/d) and a new intake facility (6,000 m^3/d) to improve the current water supply condition together with expansion of its service area.

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

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 assumed 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.

With regard to water source development, information on the untapped spring sources was collected during the course of PW4SP preparation, however, the potential sources for use in Level III services were not identified at this moment.

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 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 view points 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/economical construction.

The following municipalities are to be studied for the integration, both in physical and management systems.

- Calbiga, Pinabacdao, San Sebastian and Villareal
- Calbayog City and Sta. Margarita
- Pagsanghan and Tarangnan

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

Some municipalities may have high potential in spring development. But information on the untapped spring sources favorable for urban water supply was not available during the course of PW4SP preparation. In case of utilizing spring sources, detailed survey to ensure appropriate developments 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 70% of the total number of required facilities, considering the existing share between public (71%) and private facilities (29%).

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 adopting its share of 20%. This takes into account the existing percentage of developed springs (19%) among public Level I facilities as safe water sources.

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 well construction to ensure yield of groundwater 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 hydro-geological condition including existence of natural gravel at the expected aquifer.

It is important to study the potential area 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 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 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 operational experience of up to 40 m in pumping water level, the diameter of riser pipe shall 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 suitable for new construction of Level II systems.

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 considered.

(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 use 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 and bus/jeepney terminal.

The standard design of DOH 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 to be 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 2004. 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 popula-

tion 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, there are one (1) possible spring that can be utilized for Level II among the 15 untapped springs 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 69,200 persons in the province will be served by additional water supply services, of which 57,200 persons or 83% of the total will be urban population and 12,000 persons or 17% will be rural population.

For Phase II period, a total of 280,100 persons, of which 165,400 persons or 60% in urban area and 114,700 persons or 40% 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 51,600 persons served by Level I and II facilities in 1998.

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 2004 and 2010.

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

Name of Municipality/City	Area	Phase I Coverage (2004)									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
Almagro	Urban	321	76	222		298	76			76	351	333			333	257			257
	Rural	11,661		1,908	6,366	8,274					12,766		1,908	9,964	11,872			3,598	3,598
	Total	11,982	76	2,130	6,366	8,572	76			76	13,117	333	1,908	9,964	12,205	257		3,598	3,855
Basey	Urban	11,961	6,292	589	3,350	10,731	2,835			2,835	12,152	11,544			11,544	4,752			4,752
	Rural	29,142	6,767	1,554	9,719	18,040		471	1,382	1,853	29,607	6,767	1,554	19,214	27,535			9,495	9,495
	Total	41,103	13,559	2,143	13,069	28,771	2,835	471	1,382	4,688	41,759	18,311	1,554	19,214	39,079	4,752		9,495	14,247
Calbayog City	Urban	119,709	67,730	1,729	18,417	87,876	28,372			28,372	127,465	121,092			121,092	53,362			53,362
	Rural	23,500	12,588	7,944	2,968	23,500					25,022	12,588	7,944	2,968	23,500				
	Total	143,209	80,318	9,673	21,385	111,376	28,372			28,372	152,487	133,680	7,944	2,968	144,592	53,362			53,362
Calbiga	Urban	4,772	4,698			4,698	1,131			1,131	4,932	4,698			4,698				
	Rural	14,263	5,384		4,799	10,183					14,743	5,384		8,327	13,711			3,528	3,528
	Total	19,035	10,082		4,799	14,881	1,131			1,131	19,675	10,082		8,327	18,409			3,528	3,528
Catbalogan (Capital)	Urban	59,495	32,979	365	14,834	48,178					62,336	59,219			59,219	26,240			26,240
	Rural	22,753	2,588	1,033	8,889	12,510			1,447	1,447	23,840	2,588	1,033	18,550	22,171			9,661	9,661
	Total	82,248	35,567	1,398	23,723	60,688			1,447	1,447	86,176	61,807	1,033	18,550	81,390	26,240		9,661	35,901
Daram	Urban	12,718	3,014	1,434	5,359	9,807	3,014			3,014	13,287	12,623			12,623	9,609			9,609
	Rural	23,469		2,445	14,394	16,839					24,519		2,445	20,358	22,803			5,964	5,964
	Total	36,187	3,014	3,879	19,753	26,646	3,014			3,014	37,806	12,623	2,445	20,358	35,426	9,609		5,964	15,573
Gandara	Urban	7,121	1,688	210	3,076	4,974	1,688			1,688	7,676	7,292			7,292	5,604			5,604
	Rural	23,775			14,883	14,883			1,512	1,512	25,629			23,835	23,835			8,952	8,952
	Total	30,896	1,688	210	17,959	19,857	1,688		1,512	3,200	33,305	7,292		23,835	31,127	5,604		8,952	14,556
Hinabangan	Urban	6,100	4,799			4,799					6,181	5,872			5,872	1,073			1,073
	Rural	6,299			4,408	4,408					6,382			5,935	5,935			1,527	1,527
	Total	12,399	4,799		4,408	9,207					12,563	5,872		5,935	11,807	1,073		1,527	2,600
Jiabong	Urban	4,647	3,634			3,634					5,114	4,858			4,858	1,224			1,224
	Rural	13,603		1,526	5,694	7,220			865	865	14,970		1,526	12,396	13,922			6,702	6,702
	Total	18,250	3,634	1,526	5,694	10,854			865	865	20,084	4,858	1,526	12,396	18,780	1,224		6,702	7,926
Marabut	Urban	1,309	310	171	585	1,066	310			310	1,309	1,244			1,244	934			934
	Rural	8,855		1,482	3,554	5,036			563	563	8,729		1,482	6,636	8,118			3,082	3,082
	Total	10,164	310	1,653	4,139	6,102	310		563	873	10,038	1,244	1,482	6,636	9,362	934		3,082	4,016
Matuguinao	Urban	3,380	801	610	1,411	2,822	801			801	3,856	3,663			3,663	2,862			2,862
	Rural	3,228			1,160	1,160			205	205	3,682			3,424	3,424			2,264	2,264
	Total	6,608	801	610	2,571	3,982	801		205	1,006	7,538	3,663		3,424	7,087	2,862		2,264	5,126
Motiong	Urban	5,493	1,302	1,404	2,329	5,035	1,302			1,302	5,768	5,480			5,480	4,178			4,178
	Rural	8,759			5,538	5,538			557	557	9,197			8,553	8,553			3,015	3,015
	Total	14,252	1,302	1,404	7,867	10,573	1,302		557	1,859	14,965	5,480		8,553	14,033	4,178		3,015	7,193
Pagsanghan	Urban	1,715	406		648	1,054	406			406	1,888	1,794			1,794	1,388			1,388
	Rural	6,953			4,423	4,423			442	442	7,654			7,118	7,118			2,695	2,695
	Total	8,668	406		5,071	5,477	406		442	848	9,542	1,794		7,118	8,912	1,388		2,695	4,083

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

Name of Municipality/City	Area	Phase I Coverage (2004)									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
Paranas (Wright)	Urban	12,728	5,557	1,282	2,001	8,840	3,017			3,017	13,236	12,574			12,574	7,017			7,017
	Rural	13,059	370	2,116	6,533	9,019			831	831	13,580	370	2,116	10,143	12,629			3,610	3,610
	Total	25,787	5,927	3,398	8,534	17,859	3,017		831	3,848	26,816	12,944	2,116	10,143	25,203	7,017		3,610	10,627
Pinabacdao	Urban	1,210	287		742	1,029	287			287	1,288	1,224			1,224	937			937
	Rural	11,623			7,503	7,503					12,370			11,504	11,504			4,001	4,001
	Total	12,833	287		8,245	8,532	287			287	13,658	1,224		11,504	12,728	937		4,001	4,938
San Jorge	Urban	3,520	834	422		1,256	834			834	3,833	3,641			3,641	2,807			2,807
	Rural	10,261		1,145	6,106	7,251					11,172		1,145	9,245	10,390			3,139	3,139
	Total	13,781	834	1,567	6,106	8,507	834			834	15,005	3,641	1,145	9,245	14,031	2,807		3,139	5,946
San Jose De Buan	Urban	2,741	650	479	1,135	2,264	650			650	3,083	2,929			2,929	2,279			2,279
	Rural	3,999			763	763			254	254	4,498			4,183	4,183			3,420	3,420
	Total	6,740	650	479	1,898	3,027	650		254	904	7,581	2,929		4,183	7,112	2,279		3,420	5,699
San Sebastian	Urban	2,410	571		419	990	571			571	2,559	2,431			2,431	1,860			1,860
	Rural	4,627			2,883	2,883			294	294	4,913			4,569	4,569			1,686	1,686
	Total	7,037	571		3,302	3,873	571		294	865	7,472	2,431		4,569	7,000	1,860		1,686	3,546
Santa Margarita	Urban	16,868	3,998		11,019	15,017	3,998			3,998	18,065	17,162			17,162	13,164			13,164
	Rural	4,573			1,665	1,665			291	291	4,898			4,555	4,555			2,890	2,890
	Total	21,441	3,998		12,684	16,682	3,998		291	4,289	22,963	17,162		4,555	21,717	13,164		2,890	16,054
Santa Rita	Urban	17,200	4,076	920	6,899	11,895	4,076			4,076	18,515	17,589			17,589	13,513			13,513
	Rural	15,502		667	11,632	12,299			986	986	16,688		667	14,853	15,520			3,221	3,221
	Total	32,702	4,076	1,587	18,531	24,194	4,076		986	5,062	35,203	17,589	667	14,853	33,109	13,513		3,221	16,734
Santo Niño	Urban	3,087	732	332	477	1,541	732			732	3,240	3,078			3,078	2,346			2,346
	Rural	10,704		917	5,092	6,009			681	681	11,234		917	9,531	10,448			4,439	4,439
	Total	13,791	732	1,249	5,569	7,550	732		681	1,413	14,474	3,078	917	9,531	13,526	2,346		4,439	6,785
Tagapul-An	Urban	2,307	547		789	1,336	547			547	2,508	2,383			2,383	1,836			1,836
	Rural	6,845		587	4,119	4,706					7,442		587	6,334	6,921			2,215	2,215
	Total	9,152	547	587	4,908	6,042	547			547	9,950	2,383	587	6,334	9,304	1,836		2,215	4,051
Talalora	Urban	2,230	529	75	1,226	1,830	529			529	2,327	2,211			2,211	1,682			1,682
	Rural	4,793		351	3,474	3,825					5,000		351	4,299	4,650			825	825
	Total	7,023	529	426	4,700	5,655	529			529	7,327	2,211	351	4,299	6,861	1,682		825	2,507
Tarangnan	Urban	3,702	877		1,621	2,498	877			877	4,033	3,831			3,831	2,954			2,954
	Rural	18,020		458	10,043	10,501					19,633		458	17,801	18,259			7,758	7,758
	Total	21,722	877	458	11,664	12,999	877			877	23,666	3,831	458	17,801	22,090	2,954		7,758	10,712
Villareal	Urban	3,543	840	160	1,076	2,076	840			840	3,602	3,422			3,422	2,582			2,582
	Rural	19,424		238	4,402	4,640			1,235	1,235	19,747		238	18,127	18,365			13,725	13,725
	Total	22,967	840	398	5,478	6,716	840		1,235	2,075	23,349	3,422	238	18,127	21,787	2,582		13,725	16,307
Zumarraga	Urban	1,296	307		953	1,260	307			307	1,361	1,293			1,293	986			986
	Rural	14,405			10,756	10,756					15,132			14,073	14,073			3,317	3,317
	Total	15,701	307		11,709	12,016	307			307	16,493	1,293		14,073	15,366	986		3,317	4,303
Provincial Total	Urban	311,583	148,034	10,404	78,366	236,804	57,200			57,200	329,965	313,480			313,480	165,446			165,446
	Rural	334,095	27,697	24,371	161,766	213,834		471	11,545	12,016	353,047	27,697	24,371	276,495	328,563			114,729	114,729
	Total	645,678	175,731	34,775	240,132	450,638	57,200	471	11,545	69,216	683,012	341,177	24,371	276,495	642,043	165,446		114,729	280,175

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 75,248. Additional households to be served totaled to 33,662, of which 65% is urban households and 35% is rural households. While at the end of Phase II period, the number of served households are 136,734 with an additional households to be served at 61,507. Table 8.5.2 provides the number of households to be served by target year for urban and rural areas.

(2) School toilets

The service coverage or the number of public school students to be served is estimated by municipality for the years 2004and 2010.

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.

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

Name of Municipality/ City	Area	Phase I Coverage (2004)									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
Almagro	Urban	65	7	33	4	44	7	8	2	17	88	41	32	4	82	34	4		38
	Rural	2,323		871	291	1,162		432	82	514	3,192		1,880	291	2,171		1,009		1,009
	Total	2,388	7	904	295	1,206	7	440	84	531	3,280	41	1,917	295	2,253	34	1,013		1,047
Basey	Urban	2,441	249	1,245	166	1,660	159	454	98	711	3,038	1,413	1,246	166	2,825	1,164	1		1,165
	Rural	6,187		2,320	774	3,094		1,011	151	1,162	7,402	503	3,756	774	5,033	503	1,436		1,939
	Total	8,628	249	3,565	940	4,754	159	1,465	249	1,873	10,440	1,916	5,002	940	7,858	1,667	1,437		3,104
Calbayog City	Urban	23,199	2,366	11,831	1,578	15,775	1,794	6,822	1,149	9,765	31,866	14,818	13,239	1,578	29,635	12,452	1,408		13,860
	Rural	4,776		2,830	943	3,773		274		274	6,256	425	2,886	943	4,254	425	56		481
	Total	27,975	2,366	14,661	2,521	19,548	1,794	7,096	1,149	10,039	38,122	15,243	16,125	2,521	33,889	12,877	1,464		14,341
Calbiga	Urban	927	95	472	63	630	64	205	40	309	1,235	574	510	63	1,147	479	38		517
	Rural	2,923		1,096	366	1,462		474	70	544	3,686	251	1,889	366	2,506	251	793		1,044
	Total	3,850	95	1,568	429	2,092	64	679	110	853	4,919	825	2,399	429	3,653	730	831		1,561
Catbalogan (Capital)	Urban	11,376	1,160	5,802	774	7,736	736	2,089	456	3,281	15,584	7,247	6,472	774	14,493	6,087	670		6,757
	Rural	4,409		1,654	551	2,205		728	110	838	5,960	405	3,097	551	4,053	405	1,443		1,848
	Total	15,785	1,160	7,456	1,325	9,941	736	2,817	566	4,119	21,544	7,652	9,569	1,325	18,546	6,492	2,113		8,605
Daram	Urban	2,263	231	1,154	154	1,539	231	386	95	712	3,322	1,545	1,390	154	3,089	1,314	236		1,550
	Rural	4,462		1,673	558	2,231		736	112	848	6,130		3,610	558	4,168		1,937		1,937
	Total	6,725	231	2,827	712	3,770	231	1,122	207	1,560	9,452	1,545	5,000	712	7,257	1,314	2,173		3,487
Gandara	Urban	1,359	139	693	92	924	139	298	62	499	1,919	893	800	92	1,785	754	107		861
	Rural	4,803		1,801	601	2,402		819	134	953	6,407		3,756	601	4,357		1,955		1,955
	Total	6,162	139	2,494	693	3,326	139	1,117	196	1,452	8,326	893	4,556	693	6,142	754	2,062		2,816
Hinabangan	Urban	1,089	111	556	74	741	74	230	46	350	1,545	719	644	74	1,437	608	88		696
	Rural	1,129		424	141	565		160	15	175	1,596		944	141	1,085		520		520
	Total	2,218	111	980	215	1,306	74	390	61	525	3,141	719	1,588	215	2,522	608	608		1,216
Jiabong	Urban	824	84	420	56	560	56	175	35	266	1,279	595	538	56	1,189	511	118		629
	Rural	2,538		952	317	1,269		465	85	550	3,743		2,228	317	2,545		1,276		1,276
	Total	3,362	84	1,372	373	1,829	56	640	120	816	5,022	595	2,766	373	3,734	511	1,394		1,905
Marabut	Urban	268	27	157	18	182	27	32	10	69	327	152	134	18	304	125			125
	Rural	1,736		651	217	868		281	41	322	2,182		1,267	217	1,484		616		616
	Total	2,004	27	788	235	1,050	27	313	51	391	2,509	152	1,401	235	1,788	125	616		741
Matuguinao	Urban	609	62	311	41	414	62	140	28	230	964	449	407	41	897	387	96		483
	Rural	594		223	74	297		98	15	113	921		552	74	626		329		329
	Total	1,203	62	534	115	711	62	238	43	343	1,885	449	959	115	1,523	387	425		812
Motiong	Urban	1,017	104	519	69	692	104	175	43	322	1,442	671	601	69	1,341	567	82		649
	Rural	1,681		631	210	841		278	42	320	2,299		1,353	210	1,563		722		722
	Total	2,698	104	1,150	279	1,533	104	453	85	642	3,741	671	1,954	279	2,904	567	804		1,371
Pagsanghan	Urban	343	35	175	23	233	35	87	16	138	472	220	196	23	439	185	21		206
	Rural	1,251		469	157	626		218	37	255	1,914		1,145	157	1,302		676		676
	Total	1,594	35	644	180	859	35	305	53	393	2,386	220	1,341	180	1,741	185	697		882
Paranas (Wright)	Urban	2,471	252	1,260	168	1,680	185	656	116	955	3,309	1,539	1,370	168	3,077	1,287	110		1,397
	Rural	2,521		946	315	1,261		303	9	312	3,395	231	1,763	315	2,309	231	817		1,048
	Total	4,992	252	2,206	483	2,941	185	959	125	1,267	6,704	1,770	3,133	483	5,386	1,518	927		2,445
Pinabacdao	Urban	225	23	115	15	153	23	31	9	63	322	150	134	15	299	127	19		146
	Rural	2,275		853	285	1,138		408	73	481	3,093		1,818	285	2,103		965		965
	Total	2,500	23	968	300	1,291	23	439	82	544	3,415	150	1,952	300	2,402	127	984		1,111
San Jorge	Urban	626	64	319	43	426	64	161	31	256	958	446	402	43	891	382	83		465
	Rural	2,060		772	258	1,030		339	52	391	2,793		1,641	258	1,899		869		869
	Total	2,686	64	1,091	301	1,456	64	500	83	647	3,751	446	2,043	301	2,790	382	952		1,334

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

Name of Municipality/ City	Area	Phase I Coverage (2004)									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
San Jose De Buan	Urban	572	58	292	39	389	58	118	26	202	771	359	319	39	717	301	27		328
	Rural	853		320	107	427		152	27	179	1,125		658	107	765		338		338
	Total	1,425	58	612	146	816	58	270	53	381	1,896	359	977	146	1,482	301	365		666
San Sebastian	Urban	448	46	228	31	305	46	87	20	153	640	298	266	31	595	252	38		290
	Rural	924		346	116	462		151	23	174	1,228		719	116	835		373		373
	Total	1,372	46	574	147	767	46	238	43	327	1,868	298	985	147	1,430	252	411		663
Santa Margarita	Urban	3,478	355	1,773	237	2,365	355	690	154	1,199	4,516	2,100	1,863	237	4,200	1,745	90		1,835
	Rural	904		339	113	452		73		73	1,225		720	113	833		381		381
	Total	4,382	355	2,112	350	2,817	355	763	154	1,272	5,741	2,100	2,583	350	5,033	1,745	471		2,216
Santa Rita	Urban	3,461	353	1,765	235	2,353	353	869	166	1,388	4,629	2,153	1,917	235	4,305	1,800	152		1,952
	Rural	3,016		1,131	377	1,508		366	12	378	4,172		2,460	377	2,837		1,329		1,329
	Total	6,477	353	2,896	612	3,861	353	1,235	178	1,766	8,801	2,153	4,377	612	7,142	1,800	1,481		3,281
Santo Nino	Urban	651	66	333	44	443	66	108	27	201	810	377	332	44	753	311			311
	Rural	2,162		811	270	1,081		371	61	432	2,809		1,640	270	1,910		829		829
	Total	2,813	66	1,144	314	1,524	66	479	88	633	3,619	377	1,972	314	2,663	311	829		1,140
Tagapul-An	Urban	533	54	272	36	362	54	137	26	217	627	292	255	36	583	238			238
	Rural	1,342		503	168	671		221	34	255	1,861		1,097	168	1,265		594		594
	Total	1,875	54	775	204	1,033	54	358	60	472	2,488	292	1,352	204	1,848	238	594		832
Talalora	Urban	446	45	228	30	303	45	59	17	121	582	271	240	30	541	226	12		238
	Rural	889		334	111	445		157	27	184	1,250		739	111	850		405		405
	Total	1,335	45	562	141	748	45	216	44	305	1,832	271	979	141	1,391	226	417		643
Tarangnan	Urban	730	74	372	50	496	74	121	31	226	1,008	469	418	50	937	395	46		441
	Rural	3,540		1,327	443	1,770		647	119	766	4,908		2,894	443	3,337		1,569		1,569
	Total	4,270	74	1,699	493	2,266	74	768	150	992	5,916	469	3,312	493	4,274	395	1,615		2,008
Villareal	Urban	663	68	338	45	451	68	87	26	181	901	419	374	45	838	351	36		387
	Rural	3,679		1,380	460	1,840		619	97	716	4,937		2,897	460	3,357		1,517		1,517
	Total	4,342	68	1,718	505	2,291	68	706	123	897	5,838	419	3,271	505	4,195	351	1,553		1,904
Zumarraga	Urban	240	24	123	16	163	24	31	9	64	340	158	142	16	316	134	19		153
	Rural	2,698		1,012	337	1,349		476	82	558	3,783		2,235	337	2,572		1,223		1,223
	Total	2,938	24	1,135	353	1,512	24	507	91	622	4,123	158	2,377	353	2,888	134	1,242		1,376
Provincial Total	Urban	60,324	6,152	30,766	4,101	41,019	4,901	14,256	2,738	24,895	82,492	38,368	34,246	4,101	76,715	32,216	3,501		35,717
	Rural	65,675		25,669	8,560	34,229		10,252	1,510	11,767	88,267	1,815	49,644	8,560	60,019	1,815	23,975		25,790
	Total	125,999	6,152	56,435	12,661	75,248	4,901	24,513	4,248	33,662	170,759	40,183	83,890	12,661	136,734	34,031	27,476		61,507

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 106,422. The additional students to be served are 46,184. While at the end of Phase II period, the projected number of served students are 147,896 with an additional students to be served at 41,677. Table 8.5.3 summarizes the number of public school students to be served 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 (2004)			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
Almagro	2,552	2,161	801	2,957	2,661	500
Basey	10,377	6,859	3,259	10,542	9,488	2,629
Calbayog City	33,415	12,133	10,493	35,580	32,022	19,889
Calbiga	4,993	4,848	1,568	5,161	4,645	
Catbalogan (Capital)	20,620	14,355	6,475	21,605	19,445	5,090
Daram	7,883	7,036	2,476	8,785	7,907	871
Gandara	6,830	5,985	2,145	7,718	6,946	961
Hinabangan	3,370	2,578	1,058	3,414	3,073	495
Jiabong	3,762	3,421	1,181	4,416	3,974	553
Marabut	2,742	1,901	861	2,708	2,437	536
Matuguinao	944	856	296	1,175	1,058	202
Motiong	3,672	2,560		4,070	3,663	1,103
Pagsanghan	2,028	1,597	637	2,356	2,120	523
Paranas (Wright)	7,054	5,815	2,215	7,335	6,602	787
Pinabacdao	3,266	2,866	1,026	3,669	3,302	436
San Jorge	2,531	1,995	795	2,952	2,657	662
San Jose De Buan	1,291	918		1,452	1,307	389
San Sebastian	1,683	1,249	529	1,787	1,608	359
Santa Margarita	4,333	4,121	1,361	4,950	4,455	334
Santa Rita	6,921	5,773	2,173	7,947	7,152	1,379
Santo Niño	3,213	2,209	1,009	3,560	3,204	995
Tagapul-An	2,196	1,810	690	2,520	2,268	458
Talalora	1,842	1,378	578	1,922	1,730	352
Tarangnan	5,109	4,644	1,604	5,894	5,305	661
Villareal	6,138	4,568	1,928	6,240	5,616	1,048
Zumarraga	3,266	2,786	1,026	3,612	3,251	465
Provincial Total	152,031	106,422	46,184	164,327	147,896	41,677

(3) Public toilets

The service coverage of public utilities with sanitary toilet facility by municipality is estimated for the years 2004 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 15. The additional public utility to be served is 1. While at the end of Phase II period, no additional public utilities to be served. Table 8.5.4 summarizes the additional number of public utilities to be served by municipality by target year.

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.

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 50% 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.

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

Name of Municipality/City	Type	Phase I Coverage (2004)		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
Almagro	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Basey	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Calbayog City	Public Market		1		1
	Bus/Jeepney Terminal		8		8
	Parks/Playground		3		3
	Total		12		12
Calbiga	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Catbalogan (Capital)	Public Market				
	Bus/Jeepney Terminal	1	1		1
	Parks/Playground		1		1
	Total	1	2		2
Daram	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Gandara	Public Market		1		1
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total		1		1
Hinabangan	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Jiabong	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Marabut	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Matuguinao	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Motiong	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Pagsanghan	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Paranas (Wright)	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				

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 (2004)		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
Pinabacdao	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
San Jorge	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
San Jose De Buan	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
San Sebastian	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Santa Margarita	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Santa Rita	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Santo Niño	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Tagapul-An	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Talalora	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Tarangnan	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Villareal	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Zumarraga	Public Market				
	Bus/Jeepney Terminal				
	Parks/Playground				
	Total				
Provincial Total	Public Market		2		2
	Bus/Jeepney Terminal	1	9		9
	Parks/Playground		4		4
	Total	1	15		15

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
Basey	12,152	11,544	6,076
Calbayog City	127,465	121,092	63,733
Catbalogan (Capital)	62,336	59,219	31,168
Daram	13,287	12,623	6,644
Paranas (Wright)	13,236	12,574	6,618
Santa Margarita	18,065	17,162	9,033
Santa Rita	18,515	17,589	9,258
Provincial Total	329,965	313,467	132,530

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 (2004)		
		No. of Urban Households	Urban Households Coverage	Add'l. No. of Urban Households to be Served
Almagro		65	33	33
Basey		2,441	1,221	1,221
Calbayog City		23,199	11,600	11,600
Calbiga		927	464	464
Catbalogan (Capital)		11,376	5,688	5,688
Daram		2,263	1,132	1,132
Gandara		1,359	680	680
Hinabangan		1,089	545	545
Jiabong		824	412	412
Marabut		268	134	134
Matuguinao		609	305	305
Motiong		1,017	509	509
Pagsanghan		343	172	172
Paranas (Wright)		2,471	1,236	1,236
Pinabacdao		225	113	113
San Jorge		626	313	313
San Jose De Buan		572	286	286
San Sebastian		448	224	224
Santa Margarita		3,478	1,739	1,739
Santa Rita		3,461	1,731	1,731
Santo Niño		651	326	326
Tagapul-An		533	267	267
Talalora		446	223	223
Tarangnan		730	365	365
Villareal		663	332	332
Zumarraga		240	120	120
Provincial Total		60,324	30,170	30,170

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).

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 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, 70% of the total required Level I facilities will be implemented by public (LGUs) and 20% of these public Level I facilities will be allocated to developed spring.

(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;

Table 8.6.1 Water Supply Facilities Required by Target Year

Name of Municipality/City	Phase I (2004) 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		
Almagro	New	1	15									1	64					60	60
Basey	Expansion	1	579	1	20		8		8	12	20	1	1,188		64		64	95	159
Calbayog City	Expansion	4	5,498									7	13,341						
Calbiga	Expansion	1	220												6		6	53	59
Catbalogan (Capital)	N/A						14		14	5	19	4	6,560		114		114	48	162
Daram	New	1	536									2	2,402					100	100
Gandara	New	1	322				14		14	6	20	1	1,401		105		105	45	150
Hinabangan	N/A											1	268		3		3	23	26
Jiabong	N/A					2			2	9	11	1	306	12			12	100	112
Marabut	New	1	64							7	7	1	234					52	52
Matuguinao	New	1	144					2	2	1	3	1	716			19	19	19	38
Motiong	New	1	241			4			4	3	7	1	1,045	26			26	25	51
Pagsanghan	New	1	81				5		5		5	1	347		45		45		45
Paranas (Wright)	Expansion	1	586				2		2	9	11	1	1,754		7		7	54	61
Pinabacdao	New	1	53									1	234		27		27	40	67
San Jorge	New	1	148									1	702		16		16	37	53
San Jose De Buan	New	1	136							4	4	1	570					57	57
San Sebastian	New	1	106				4		4		4	1	465		27		27	2	29
Santa Margarita	New	1	824				4		4		4	2	3,291		49		49		49
Santa Rita	New	1	820				6		6	7	13	2	3,378		22		22	32	54
Santo Niño	New	1	154							9	9	1	587					150	150
Tagapul-An	New	1	126									1	459		1			37	37
Talalora	New	1	106									1	421	2	1		2	12	14
Tarangnan	New	1	173									1	739		130		130		130
Villareal	New	1	157				16		16		16	1	646		229		229		229
Zumarraga	New	1	57									1	247					56	56
Provincial Total	Exp.- 4 New- 19	26	11,146	1	20	6	73	2	81	72	153	37	41,365	40	844	19	903	1,097	2,000

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 44 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 in Supporting Report). Presently, neither the DEOs-DPWH or provincial government has a drilling rig applicable for deep well construction.

Therefore, one (1) set of drilling rig (medium size percussion type) together with each one (1) set of well rehabilitation equipment, support vehicle for well rehabilitation and 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

Required New Building:

To ensure potability of drinking water supplies, 2 new laboratory facilities in Calbayog City and Calbiga will be established. The new laboratory in Calbayog City will cover the island municipalities of Almagro, Sto. Nino, Tagapul-an, Margarita, Gandara, Matuguinao, Pagsanghan and San Jose. While the Calbiga laboratory will cover the municipalities of Calbiga, Hinabangan, Pinabacdao, Villareal, Basey, Sta. Rita and Marabut. Water samples have to be examined on time to avoid unpredictable changes of the quality due to long storage, hence this proposal. The new building will have a floor area of 57m^2 to house an examining laboratory, an office space, a storage room and a toilet. Water and power supplies will be provided.

Instrument/Equipment and Other Laboratory Accessory:

Three (3) sets of instrument/equipment will be necessary to undertake regular water quality monitoring and surveillance activities. The distribution would be 1 set for the upgrading of the existing provincial laboratory, and the other 2 sets, to the new laboratories. The new laboratory will also be provided with laboratory accessories such as sink, working table, etc. The following are the requirements:

	Item	Unit	Upgrading of Existing Laboratory	New Laboratories Calbayog	Calbiga
1.	Instrument/Equipment				
	Turbidity meter	set	1	1	1
	Color meter	set	1	1	1
	pH/Residual chlorine checker	set	1	1	1
	Incubator	set	1	1	1
	Refrigerator	set	1	1	1
	Sterilizer	set	1	1	1
	Portable water quality testing kit	set	1	1	1
	Electric stove	set	1	1	1
	Range hood	set	1	1	1
2.	Glassware/Chemical	set	1	1	1
3.	Accessory				
	Sink	set	1	1	1
	Working table	set	1	1	1
	Shelf	set	1	1	1
	Office desk	set	1	1	1
	Chair	set	1	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 and the additional students to be served by target year (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.

(3) Public toilets

Future requirements in the number of toilet facilities were estimated based on the additional number of toilets for public markets and bus/jeepney terminals located in urban areas (details are referred to Supporting Report).

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 seven (27) additional units of truck are required to meet assumed service coverage as reflected in Table 8.6.3.

Table 8.6.2 Sanitation Facilities Required by Target Year

Name of Municipality/City	Phase I (2004) Requirements													Phase II (2010) Requirements											
	Urban Sanitation								Rural Sanitation					Urban Sanitation								Rural Sanitation			
	No. of Households				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	
Almagro	7	8	2	17					432	82	514	4		34	4		38						1,069		1,069	13
Basey	159	454	98	711	5				1,011	151	1,162	12		1,164	1		1,165	4				503	1,436		1,939	34
Calbayog City	1,794	6,822	1,149	9,765	44				274		274	0		12,452	1,408		13,860	83				425	56		481	26
Calbiga	64	205	40	309	2				474	70	544	6		479	38		517					251	793		1,044	17
Catbalogan (Capital)	736	2,089	456	3,281	23		1		228	110	338	9		6,067	670		6,257	18				405	1,443		1,848	27
Daram	231	386	95	712	4				736	112	848	8		1,314	236		1,550	2					1,937		1,937	26
Gandara	139	298	62	499	2				819	134	953	8		764	107		861						1,955		1,955	27
Hinabangan	74	230	46	350	3				160	15	175	3		608	88		696						520		520	8
Jiabong	56	175	35	266	2				465	85	550	4		511	118		629						1,276		1,276	15
Marabut	27	32	10	69					281	41	322	4		125			125						616		616	11
Matuguinao	62	140	28	230					98	15	113			387	96		483						329		329	3
Motiong	104	175	43	322					278	42	320			567	82		649	2					722		722	11
Pagsanghan	35	87	16	138					218	37	255	3		185	21		206						676		676	9
Puranas (Wright)	183	656	116	955	5				303	9	312	6		1,287	110		1,397	2				231	817		1,048	17
Pinabacdao	23	31	9	63					468	73	481	5		127	19		146						965		965	15
San Jorge	64	161	31	256					339	52	391	3		382	83		465						869		869	16
San Jose De Buan	58	118	26	202					152	27	179			301	27		328						338		338	4
San Sebastian	46	87	20	153					151	23	174	2		252	38		290						373		373	5
Santa Margarita	355	690	154	1,199	5				73		73	1		1,745	90		1,835	1					381		381	5
Santa Rita	353	869	166	1,388	6				366	12	378	5		1,800	152		1,952	6					1,329		1,329	17
Santo Niño	66	108	27	201					371	61	432	4		311			311						529		529	12
Tagapul-An	54	137	26	217					221	34	255	3		238			238						594		594	8
Talalora	45	59	17	121					157	27	184	2		226	12		238						405		405	9
Tarangnan	74	121	31	226	1				647	119	766	7		395	46		441						1,567		1,567	22
Villareal	68	87	26	181					619	97	716	8		351	36		387						1,517		1,517	28
Zumarraga	24	31	9	64					476	82	558	5		134	19		153						1,223		1,223	15
Provincial Total	4,901	14,256	2,738	21,895	103		1		10,257	1,510	11,767	121		32,216	3,501		35,717	116				1,815	23,975		25,790	382

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
Almagro	33	14	1
Basey	1,221	5,511	1
Calbayog City	11,600	4,819	2
Calbiga	464	194	1
Catbalogan (Capital)	5,688	2,378	1
Daram	1,132	474	1
Gandara	680	285	1
Hinabangan	545	228	1
Jiabong	412	173	1
Marabut	134	57	1
Matuguinao	305	128	1
Motiong	509	213	1
Pagsanghan	172	72	1
Paranas (Wright)	1,236	517	1
Pinabacdao	113	48	1
San Jorge	313	131	1
San Jose De Buan	286	120	1
San Sebastian	224	94	1
Santa Margarita	1,739	727	1
Santa Rita	1,731	724	1
Santo Niño	326	137	1
Tagapul-An	267	112	1
Talalora	223	94	1
Tarangnan	365	153	1
Villareal	332	139	1
Zumarraga	120	51	1
Provincial Total	30,170	12,623	27

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.

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.

Chapter 9

SECTOR MANAGEMENT FOR MEDIUM-TERM DEVELOPMENT

9. Sector Management for Medium-Term Development

9.1 General

In order to manage the water and sanitation sector effectively, the provincial and municipal governments of Samar will have to make some adjustments in their current policies and structures.

9.1.1 Purpose of Policy and Structural Adjustment

The adjustments should be aimed at coordinating these local policies and structures more closely with the overall policies, institutional and regulatory frameworks, and resource-sharing systems of the water sector, so that the Province and its municipalities would be in the best position to realize available opportunities to improve water services, specifically:

(1) to effect immediate improvements in the physical infrastructure for water, sanitation, and related environmental services; and

(2) to acquire permanent capabilities to (a) plan, manage and institutionalize gains in sector services, (b) to nurture constructive partnerships with the private sector, and (c) to set in place and maintain the mechanisms for sustainability.

To the extent that additional resources are provided by programs like the World Bank-assisted LGU Urban Water and Sanitation Sector Project; and to the extent that the national government has instituted facilitative mechanisms to improve the sector, the provincial and municipal governments must seize the opportunities that, for the present, are available in order to achieve and expand current sectoral targets, and to ensure the long-term sustainability of sectoral gains.

9.1.2 Perspectives

In making the needed adjustments, the LGUs will do well to keep the following realities in clear perspective:

(1) That the nature of public accountability dictates certain rigidities and procedural constraints in all governmental systems. Thus, while government must fulfill its mandate as the necessary and enabling institution for the provision of basic services, it is not the most responsive, efficient, and cost-effective agent for directly implementing these services. For this reason, local governments must clearly define their role in the investment, operation, and maintenance of water service utilities;

(2) That the public -- and even many local officials -- still lack a deep realization of the importance of institutionalizing water services. This lack of realization reflects the transitional stage of most of Philippine society, to which the pervasive effects of urbanization (effects that extend even to the rural areas) and their demands on social participation in sustaining basic services are very recent and unfamiliar experiences. For this reason, the sector's social marketing endeavor must include a primary thrust of helping the community and all LGU officials understand the fundamental role of safe water and sanitation in the actualization of their most cherished of aspirations – that is, to secure a better future for their children.

(3) That large sectors in many communities, as well as some entire communities, do not have the capacity to shoulder the full cost of institutionalized water and sanitation services. LGUs are especially challenged to devise ways and means to ensure their disadvantaged constituents basic access to safe water and related services -- even as they seek fair participation from those who can afford to pay, and as they continue to exert efforts to establish these services on a permanent, self-sustaining basis.

This Chapter proposes the mechanisms, processes and structures needed in the medium-term to achieve the coverage targets with sustainability. Not all recommendations can be laid out with the same level of detail at this time as some are dependent on further policy guidelines being formulated at the national level. These include the on-going study on access of LGUs to external financing assistance and the sector devolution process.

9.2 Sector Management

9.2.1 Development of the Vision

One glaring institutional need at the local level is a common vision that could focus and mobilize the water sector's resources and the efforts of the different shareholders within a practical structure that delivers the desired services effectively in a sustainable manner. Such a common, shared vision can only be achieved if all the share shareholders realize the importance of managing water as a basic economic commodity and place value on their family's access to safe water within the framework of their own needs and aspiration.

Both the policy makers and the officials at all levels of governance and public service and a critical mass of the consumers themselves must internalize and share in the vision so that their efforts and resources could be mobilized for project implementation. Local planners need to focus on the long-term requirements i.e., beyond the technical requirements of forming users' associations, drilling wells, distributing bowls, etc. They need to work as "change agents" to

prepare themselves and their constituents to participate in ensuring that basic services like water and sanitation become available and are placed on a sustainable basis in their respective communities. With these considerations, and based on a realistic assessment of constraints, opportunities and demand, the province has set its vision and mission for the sector.

Initial vision statement: The province will adopt a two-phased plan, which seeks to dramatically improve the provision of water supply and sanitation. In the medium-term (2000-2004) plan, the province manages to maintain present service level; water supply coverage in urban areas at 76% and in rural areas at 62% (3% increase from existing). On the other hand, household toilets will be made available to 68% of the urban population and 50% of the rural population; 70% of the students in public schools will have adequate sanitary toilet facilities; 100% of public utilities will have sanitary toilets; and 50% of the urban population will be covered by solid waste collection services. For its long-term (2005-2010) plan, the province will pursue a more vigorous program to increase water supply coverage in urban areas to 95% and in rural areas to 93%. For the sanitation sub-sector, individual household toilets will increase up to 93% in urban areas and 68% in rural areas; public school toilets will rise up to 90%; public utilities will have 100% sanitary toilet coverage; while sewerage service will cover 50% of the urban population.

9.2.2 Sector Management

A Sector Management Model is presented in Figure 9.2.1 for sector management and project development. It is envisaged that this PW4SP will be used as a basis for the Annual Sector Plan and/or as input into Loan or Grant Negotiations in the future. The Annual Sector Plan, together with the budgets, will be reviewed by the Governor and passed upon by the legislature as part of the provincial budget approval process.

The sector level implementation activities consist principally of three broad areas: social marketing; technical assistance; and monitoring. Project selection follows on from a self-selection process that includes the identification of a responsible community-based association and the preparation of technical studies, as needed. Construction or rehabilitation will take place only after the institutional, financial and technical studies have been done. Operation and maintenance, including arrangements for finances of the system, will be the responsibility of the community organization. The Monitoring Function, on the other hand, will be implemented as a sectoral program, augmented with water quality surveillance by the Provincial Health Office (PHO) and operational audits done by the LGU.

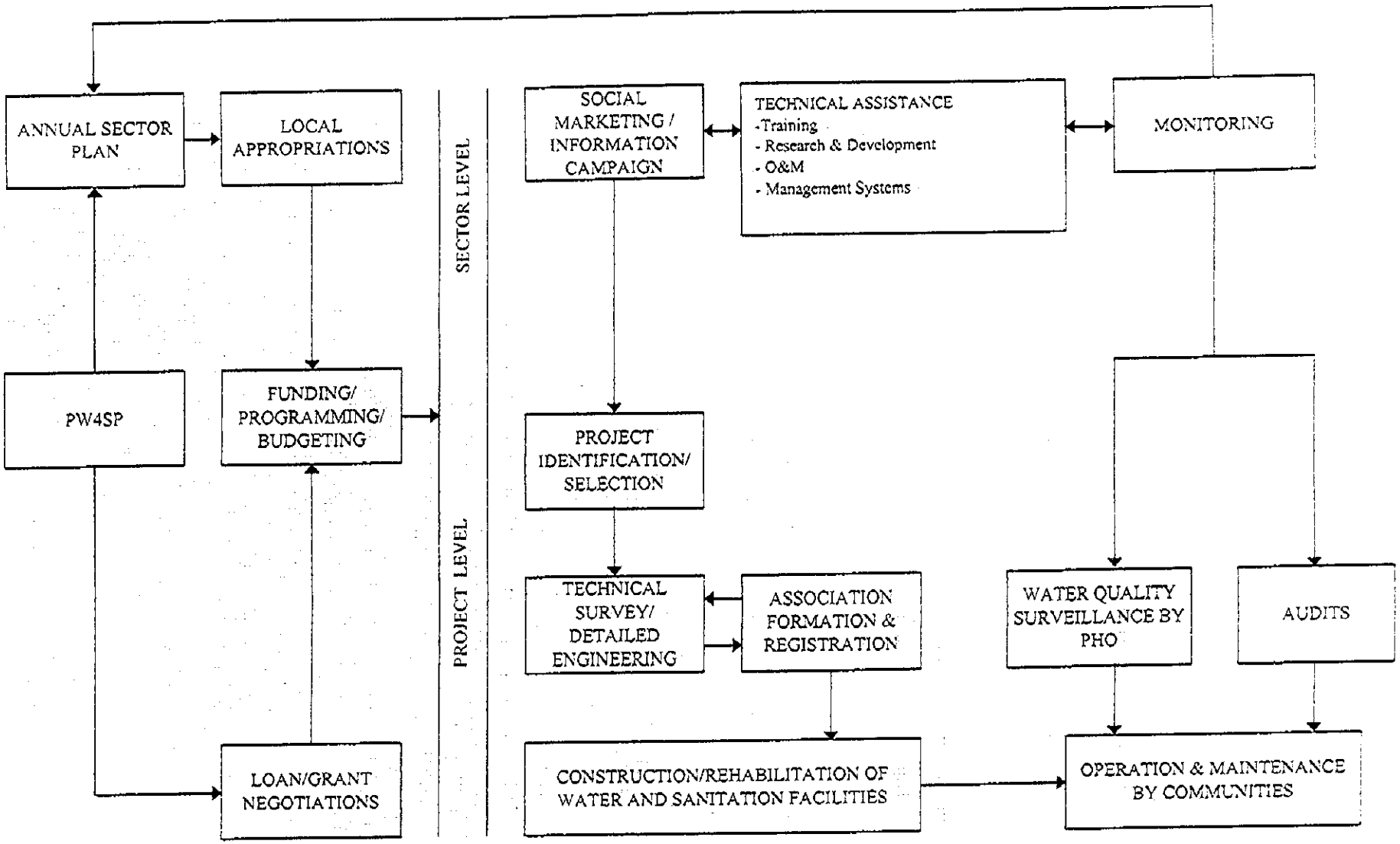

Figure 9.2.1 Sector Management Model

9.2.3 Service Provision Policies and Objectives

The LGU seeks to provide an adequate level of water and sanitation facilities defined as follows:

- Level I facilities serve at most 15 (fifteen) households per source; Level II public taps serve 5 (five) households per faucet; and Level III systems provide individual household connections.
- Water supply provision will be at least 20 lpcd for Level I; 60 lpcd for Level II; and 100 lpcd for Level III.
- A critical mass of 90% of the individual households in every barangay has sanitary toilet facilities.
- All schools shall have adequate water supply and at least one sanitary toilet facility for every 40 students.

9.2.4 Operating Policies

The following policy and strategy statements are adopted by the Provincial Government. These may be reviewed and revised from time to time by the Provincial Government. The key policy statements include the following:

(1) Sustainability shall be promoted through increased community responsibility for management of facilities. Unless potential users demonstrate initiative and commitment (beyond making the request for assistance) to maintain the systems, no support shall be provided by the LGUs. To the extent possible, the LGUs should utilize existing local resources (self-reliance).

(2) Selection and prioritization of projects shall be based on demonstrated commitment of the beneficiaries to participate in the project and their willingness to pay; the current water, sanitation and overall health conditions; potentials for growth; and cost implications.

(3) Technology to be used for the projects shall be appropriate to local conditions and resources. While economical facilities should be the objective of design and selection, construction costs should not compromise quality, reliability, and provisions for future upgrading and expansion. Phased upward integration and future upgrading of systems and facilities shall also be promoted utilizing to the extent possible previously constructed facilities. In urban centers, a range of technologies may be adopted for wastewater collection and treatment, as well as for drainage.

(4) An integrated approach to the provision of potable water supply, sanitation and hygiene education shall be promoted. All projects to be developed by the LGU must involve these three elements.

(5) As part of the overall social marketing efforts for the sector, the Province shall implement an "Information, Education and Communication Program" with the primary thrust of promoting safe water and sanitation values. A nationwide IEC Program to Create "Safe Water" Value among communities is described in the Supporting Report. At the provincial level, the IEC Program shall start with the orientation of all local government officials down to the barangay level, and be coordinated with and draw the participation of other agencies, NGOs, and civic groups throughout the province, particularly those involved in community development, social projects, and health and education services. The program shall include, among others, a component to train individuals selected from the LGUs, participating agencies and organizations, and volunteers from the communities themselves as communicators/change agents for safe water values. Figure 9.2.2 shows the schematic design of the IEC Program.

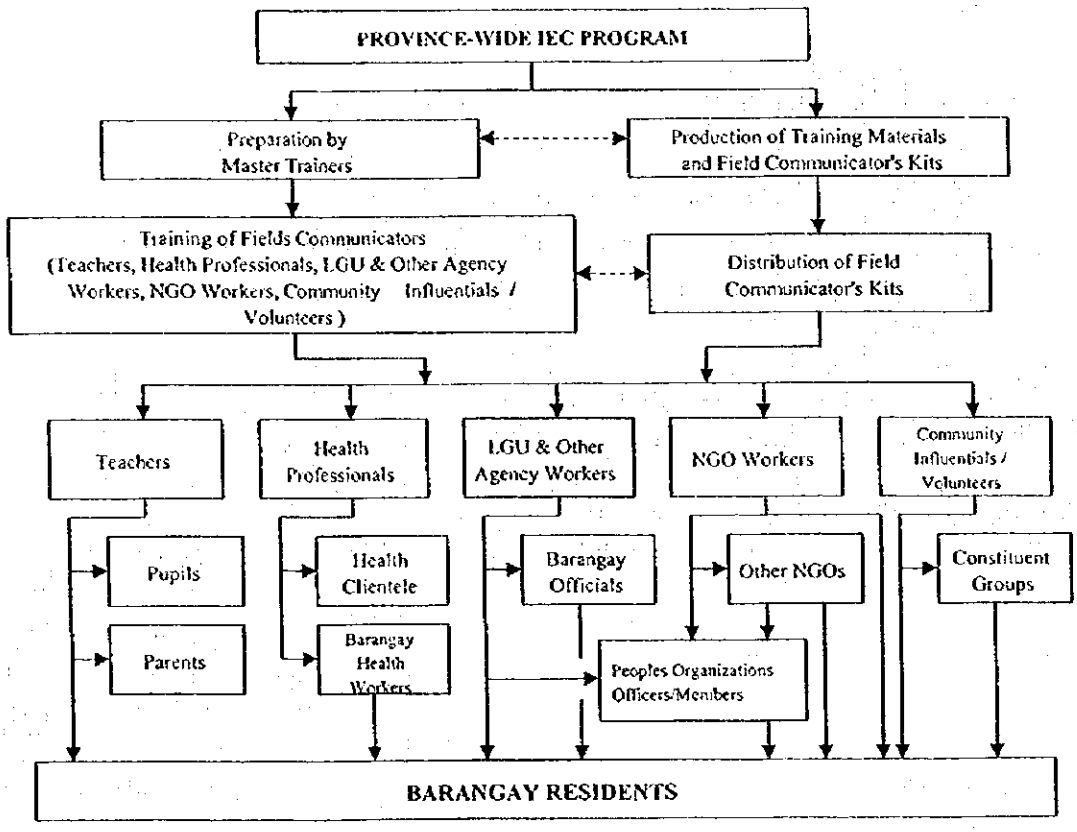

Figure 9.2.2 IEC Program Implementation Flow (Provincial Level)

(6) The LGU shall seek, to the extent possible, to provide water and sanitation services equally to all their constituents, whether they reside in rural or urban areas, or in wealthy or depressed areas.

(7) Cost Recovery and Cost Sharing (Subsidy Policies): The LGU shall enforce a rational and consistent policy on the application of subsidies and loans for water supply and sanitation. In May 1996, the Investment Coordination Committee (ICC) of the NEDA adopted a policy "to support the financing of devolved activities with social and/or environmental objectives" based on three considerations namely: Equity, Externalities and Economies of Scale. Accordingly, NEDA advised DILG of the revised cost-sharing arrangement which clearly limited the national government subsidy to Level I water supply systems for 5th and 6th class municipalities up to a maximum 50% of the total project cost. No subsidy from GOP is provided for Level II and III. For sanitation facilities, the national government subsidy for the 3r^{d} to 6th class municipalities shall be from 50% to 70% of the total project cost.

(8) Private Sector Participation: The government shall give the private sector a substantial and preferential role in the attainment of the PW4SP objectives. In harnessing their participation, less government intervention shall be exercised in areas where the private sector is or can be a key player. An environment designed to empower them to absorb new social responsibilities and proactively convey to the government their aspirations and interests shall be established. The formation of private sector groups, NGOs, community organizations, cooperatives and people's organizations shall be encouraged. The implementation of programs to develop their capabilities in the sector development programs shall be promoted.

(9) The province's fiscal management, in terms of capital funds generation capability, budget and disbursement, shall be improved. The assistance of the legislative branch in the enactment of the proposed revenue-generating measures shall be sought. Financing through the private sector will also be encouraged.

(10) Sector development shall be consistent with broader concerns for environmental protection and management. Pollution control, conservation and proper utilization of water and land resources are critical issues to be considered in development plans at all levels, including municipal land use plans. Among the specific concerns in relation to water resources that the LGUs shall address through a proactive, environmentally responsive management approach to resource use, are the preservation and enhancement

of watersheds, the prevention of pollution of streams and groundwater resources, and the protection of riverbanks and natural hydro-geological formations.

(11)Disaster Response and Emergency Coordination: The LGU shall formulate, as part of its contingency plans, a program to address emergency conditions. The program shall include maintenance of stocks of chlorine, organization and training of local communities on restoration of water supplies, and provision of emergency sanitary facilities. The LGU should coordinate closely and regularly with the local officials of the Regional Disaster Coordinating Council (RDCC).

9.2.5 Regulatory Policies

In coordination with appropriate national and local agencies, the LGU shall endeavor to set up an effective regulatory framework considering the following:

(1) Water allocation and water rights policies (conflict resolution) which are within the mandate of the National Water Resources Board. The LGUs or the concerned water utility shall apply for water rights from the Board, prior to implementing a project that would require extraction of water.

(2) Water Rate Review: While the rate setting and approval functions remain largely a concern of the associations or the Water Districts (and LWUA), a vehicle for resolving grievances against unrealistic tariffs (or other practices) can be instituted by the LGUs. The court system, of course, remains as the final arbiter in conflicts.

(3) Association Registration: The LGUs shall likewise adopt a registration and franchising system for associations responsible for water supply facilities outside the WD franchise areas. Annual reporting requirements will have to be established for monitoring and possibly, auditing purposes.

(4) Water Quality: The National Drinking Water Standards have been established. The LGUs will have to establish a viable mechanism, including water testing and standards enforcement, to ensure that water delivered meets the potability standards. The DOH currently has the responsibility and the regulatory power to stop the operations of water systems not delivering potable water.