3.4 Population

3.4.1 Previous Population Development

A declining provincial population growth rate had been experienced since the last six (6) census years (1960-1995) as indicated in Figure 3.4.1. From an average annual growth rate of 1.84% during the period 1960 to 1970, it gradually decreased to -0.26% (1990-1995). A summary of the average annual growth rates of the province is as follows:

Year	Population	Ave. Annual Growth Rate (%)	Period
1970	251,425	1.84	1960 - 1970
1975	276,418	1.91	1970 - 1975
1980	296,294	1.40	1975 - 1980
1990	321,940	0.83	1980 - 1990
1995	317,565	-0.26	1990 - 1995

A consideration on how the population growth behaved in the past and how it is likely to behave in the future is important because of the issue of resource allocation including the water supply and sanitation sector requirements.

The 1998 population was estimated to provide the planning base for this Master Plan (refer to Section 8.3.1 Population Projection, Main Report). Table 3.4.1 shows a breakdown of the past population development by municipality from 1948 to 1995.

Figure 3.4.1 Previous Population Development of the Province

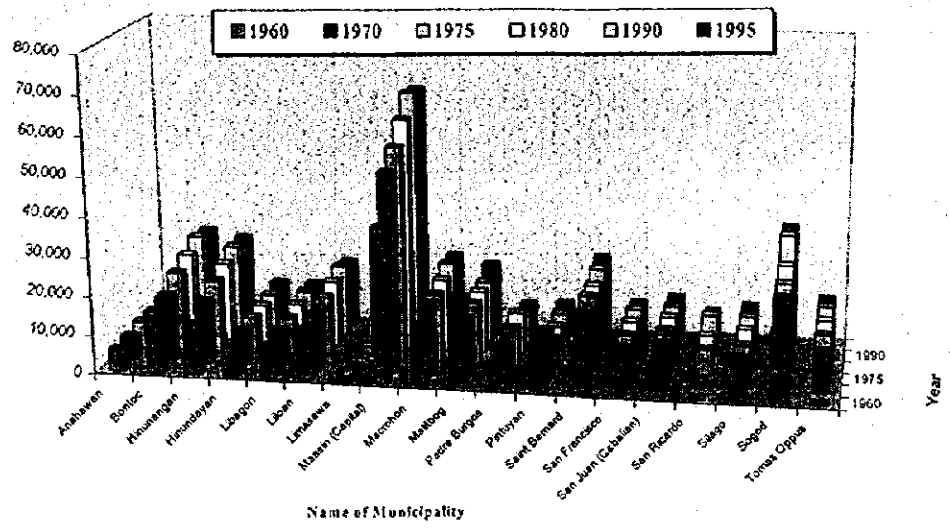


Table 3.4.1 Previous Population Development by Municipality

Municipality	Previous Population						
	1948	1960	1970	1975	1980	1990	1995
Anahawan	4,703	5,545	6,094	6,875	6,544	7,063	6,471
Bontoc		15,835	17,325	20,452	22,655	24,818	24,047
Hinunangan	17,556	12,665	16,142	18,648	20,568	22,454	22,170
Hinundayan	7,199	7,088	8,546	9,225	9,746	9,965	10,617
Libagon	7,173	7,891	9,231	9,519	10,516	11,239	10,754
Liloan	19,233	12,772	13,882	15,639	16,923	18,383	17,160
Limasawa						4,519	4,927
Maasin (Capital)	31,458	39,185	50,759	54,737	59,731	64,694	63,746
Macrohon	13,431	14,786	16,373	17,694	18,693	20,416	20,093
Malitbog	25,891	22,937	14,373	15,837	16,114	15,946	17,976
Padre Burgos		7,125	8,045	9,848	10,790	7,375	7,593
Pintuyan	11,167	11,445	12,534	7,446	7,872	8,177	8,388
Saint Bernard		11,621	17,296	19,255	19,153	20,760	21,363
San Francisco		8,613	8,928	9,456	9,995	10,438	9,543
San Juan (Cabalian)	17,922	9,069	10,616	11,136	11,614	11,703	11,392
San Ricardo				6,521	7,331	9,723	7,869
Silago		5,315	7,459	7,967	9,323	9,733	9,785
Sogod	31,848	17,716	23,487	24,373	26,246	31,342	31,062
Tomas Oppus			10,335	11,790	12,480	13,192	12,609
Provincial Total	187,581	209,608	251,425	276,418	296,294	321,940	317,565

3.4.2 Classification of Urban and Rural Areas

NSO classifies a barangay as urban when it satisfies any of the following conditions on the economic and social functions.

(1) In their entirety, all cities and municipal jurisdictions having a population density of at least 500 persons per square kilometer.

(2) Poblaciones or central districts of municipalities and cities, which have a population density of at least 500 persons per square kilometer.

(3) Poblaciones or central districts (not included in nos. 1 and 2) regardless of population size, which have the following:

1) Street pattern, i.e., network of streets either at parallel or in right angle orientation;
2) At least six establishments (commercial, manufacturing, recreational and/or personal services); and
3) At least three of the following:
   a) a town hall, church or chapel with religious services at least once a month;

b) a public plaza, park or cemetery;

c) a market place or building where trading activities are carried on at least once a week; and

d) a public building like school, hospital, health center or library.

(4) Barangays having at least 1,000 inhabitants, that meet the condition set forth in no. 3 above, and in which the occupation of the inhabitants is predominantly non-farming/fishing.

All areas not falling under the urban classification are defined as rural area. Distribution of the classified areas is shown in Figure 3.4.1, Supporting Report.

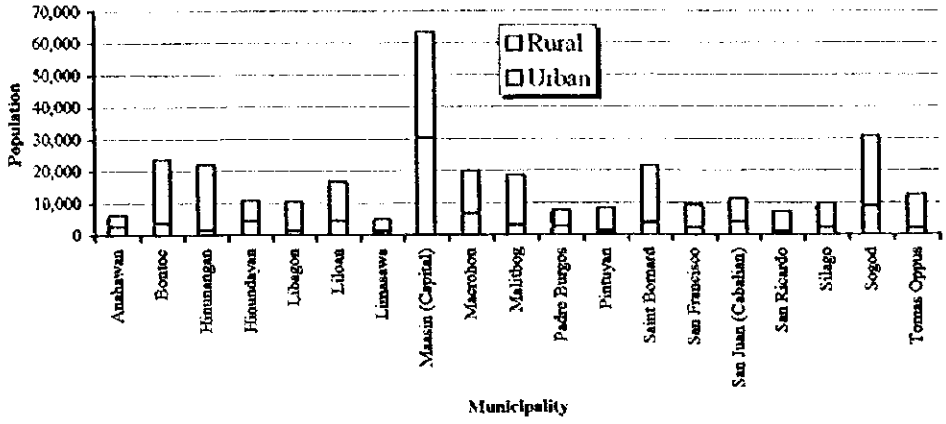
For this Master Plan, however, the 1995 NSO classification of urban and rural barangays was modified by the PSPT to reflect the actual conditions prevailing in the study area. With the re-classification, there are now 60 urban barangays and 441 rural barangays for a total of 501 barangays in 1998.

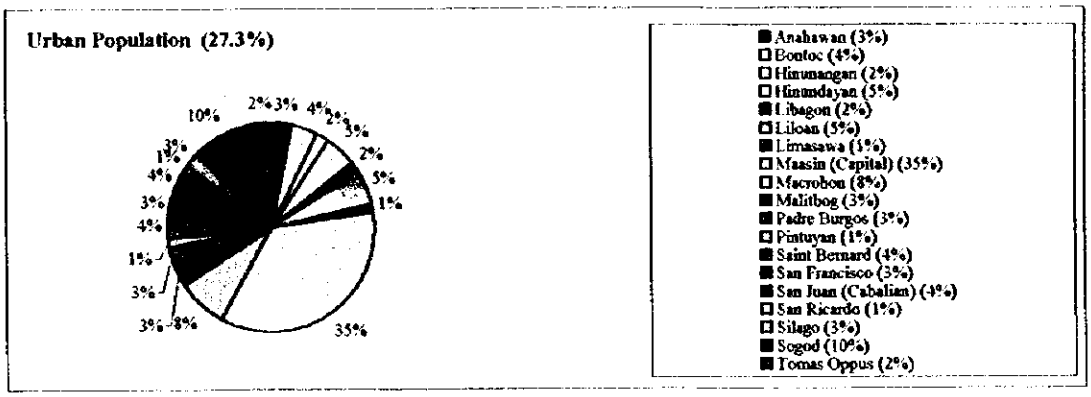
3.4.3 Present Population Distribution

From the 1995 NSO census, the 1998 urban-rural population was estimated. Rural population accounts for 73% of the provincial total, while 27% is urban as reflected in Figure 3.4.2. Table 3.4.2 presents the breakdown of the number of urban and rural barangays by municipality and its corresponding present population distribution.

There are 65,241 households with 47,384 residing in rural areas and 17,857 households in urban areas. The average provincial household size is 4.84 persons/household. Table 3.4.3 presents a breakdown per municipality on the number of households and household sizes by urban and rural area.

Figure 3.4.2 Present Population Distribution





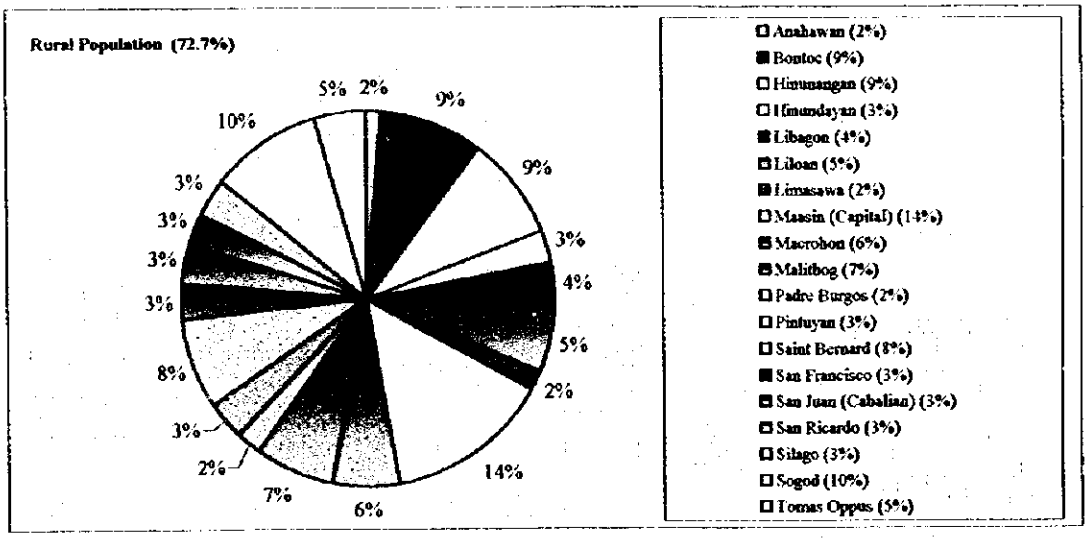


Table 3.4.2 Outline of Urban and Rural Areas in the Province

Municipality	Number of Barangay			Population (1998)		
	Urban	Rural	Total	Urban	Rural	Total
Anahawan	3	11	14	2,805	3,473	6,278
Bontoc	3	38	41	3,780	20,015	23,795
Hinunangan	2	38	40	1,575	20,502	22,077
Hinundayan	4	13	17	4,307	6,523	10,830
Libagon	2	12	14	1,450	9,146	10,596
Liloan	2	22	24	4,557	12,204	16,761
Limasawa	1	5	6	1,229	3,831	5,060
Maasin (Capital)	10	60	70	30,316	33,120	63,436
Macrohon	5	25	30	6,698	13,290	19,988
Malitbog	4	33	37	2,882	15,757	18,639
Padre Burgos	2	9	11	2,543	5,121	7,664
Pintuyan	2	21	23	1,048	7,409	8,457
Saint Bernard	2	28	30	3,475	18,085	21,560
San Francisco	3	19	22	2,222	7,029	9,251
San Juan (Cabalian)	3	15	18	3,800	7,490	11,290
San Ricardo	1	14	15	695	6,569	7,264
Silago	2	13	15	2,168	7,634	9,802
Sogod	6	39	45	8,841	22,129	30,970
Tomas Oppus	3	26	29	1,932	10,487	12,419
Provincial Total	60	441	501	86,323	229,814	316,137

Table 3.4.3 Household Numbers and Household Size

Municipality	Number of Households (1995)			Number of Households (1998)			1995 Household Size (person/household)		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Anahawan	585	817	1,402	598	762	1,360	4.69	4.56	4.62
Bontoc	757	3,978	4,735	758	3,932	4,690	4.99	5.09	5.08
Hinunangan	302	4,549	4,851	339	4,496	4,835	4.65	4.56	4.57
Hinundayan	814	1,416	2,230	911	1,365	2,276	4.73	4.78	4.76
Libagon	290	1,921	2,211	290	1,890	2,180	5.00	4.84	4.86
Liloan	917	2,677	3,594	934	2,575	3,509	4.88	4.74	4.77
Limasawa	244	752	996	253	769	1,022	4.85	4.98	4.95
Maasin (Capital)	5,298	8,062	13,360	6,264	7,017	13,281	4.84	4.72	4.77
Macrohon	1,411	2,774	4,185	1,410	2,752	4,162	4.75	4.83	4.80
Malitbog	497	2,906	3,403	561	2,967	3,528	5.14	5.31	5.28
Padre Burgos	446	1,030	1,476	486	1,002	1,488	5.23	5.11	5.14
Pintuyan	199	1,406	1,605	206	1,411	1,617	5.08	5.25	5.23
Saint Bernard	629	3,703	4,332	721	3,654	4,375	4.82	4.95	4.93
San Francisco	488	1,610	2,098	488	1,545	2,033	4.55	4.55	4.55
San Juan (Cabalian)	836	1,658	2,494	835	1,635	2,470	4.55	4.58	4.57
San Ricardo	153	1,430	1,583	153	1,309	1,462	4.54	5.02	4.97
Silago	450	1,660	2,110	461	1,652	2,113	4.70	4.62	4.64
Sogod	1,554	4,757	6,311	1,801	4,489	6,290	4.91	4.93	4.92
Tomas Oppus	388	2,203	2,591	388	2,162	2,550	4.98	4.85	4.87
Provincial Total	16,258	49,309	65,567	17,857	47,384	65,241	4.83	4.85	4.84

3.5 Health Status

3.5.1 Morbidity, Mortality and Infant Mortality

The number one cause of morbidity in Southern Leyte was diarrhea, a water-borne and water-washed disease followed by bronchitis, influenza and pneumonia. Regarding mortality, the number one cause was vascular disease, followed by pneumonia, obstructive pulmonary. Meanwhile, pneumonia, other prenatal causes and bronchitis were the 3 leading causes of infant mortality in the province (refer to Table 3.5.1, Data Report).

The general health status of the populace of the province in 1998 was relatively lower compared with the national condition. The incidence of diseases was higher in Southern Leyte than the country as a whole. Table 3.5.1 presents a comparative statistics on the ten leading causes of morbidity, mortality and infant mortality of the province as well as of the Philippines.

Table 3.5.1 Number and Rates of Ten Leading Causes of Morbidity, Mortality and Infant Mortality

Rate: 1/100,000

	Causes	Southern Leyte		Philippines		
		Number	Rate	Number	Rate	Ranking
Morbidity	1. Diarrhea	21,922	6,903	1,337,449	1,997	1
	2. Bronchitis	19,705	6,205	903,508	1,349	2
	3. Influenza	13,611	4,286	609,471	910	3
	4. Pneumonia	7,999	2,519	470,574	703	4
	5. Vascular Diseases	4,763	1,500	111,874	167	7
	6. Urinary Infections	2,467	777			
	7. Obstructive Pulmonary	1,670	526			
	8. Dengue Fever	1,588	500	159,049	238	6
	9. Conjunctivities	1,566	493			
	10. Scabies	1,134	357			
Mortality	1. Vascular Diseases	1,702	536	37,358	5669	2
	2. Pneumonia	1,197	377	35,582	53	3
	3. Obstructive Pulmonary	337	106	11,154	17	7
	4. Malignant Neoplasms	321	101	25,399	38	4
	5. Diarrhea	105	33	5,759	9	9
	6. Gastroent. Colitis	105	33			
	7. Other Accidents	92	29	13,477	20	6
	8. Urinary Infections	79	25			
	9. Nutritional Deficiencies	57	18			
	10. Meningitis	32	10			
Infant Mortality	1. Pneumonia	73	23	7,631	4.5	1
	2. Other Prenatal Causes	67	21			
	3. Bronchitis	38	12			
	4. Diarrhea	32	10	1,661	1.0	4
	5. Meningitis	32	10			
	6. Prematurity	22	7			
	7. Vascular Diseases	16	5			
	8. Measles	13	4	765	0.5	7
	9. Resp. Fetus/Newborn	10	3	5,651	3.4	2
	10. Tetanus/Rabies	6	2			

Water-related diseases in the ten leading causes of morbidity included diarrhea (rank 1st), dengue fever (8th), conjunctivities (9th) and scabies (10th). Diarrhea also ranked 5th and gastroenteritis (6th) as the leading causes of mortality. Again, diarrhea, (rank 4th) was among the ten leading causes of infant mortality.

3.5.2 Water Related Diseases

An indicator of health problems related to water supply and sanitation is the incidence of water-related diseases. The World Health Organization (WHO) has classified diseases related to water into four (4) categories: 1) water-borne diseases e.g., cholera, typhoid, hepatitis A, diarrhea and dysentery; 2) water-based diseases e.g., schistosomiasis; 3) water-washed diseases e.g., diarrhea, intestinal parasitism, scabies, conjunctivitis (sore eyes), and skin diseases; and 4) water-vector related diseases e.g., malaria, filariasis and dengue or H-fever. As with malaria, the control of filariasis is beyond this Master Plan. A safe water supply, sanitary toilet and proper hygiene practices are conditions necessary for the control and prevention of these diseases.

Water-related diseases reported in the province in 1998 were typhoid, intestinal parasitism, diarrhea, conjunctivities, dengue fever, viral hepatitis, gastro-enteritis, skin diseases and scabies. Table 3.5.2 presents the reported cases and deaths of notifiable water-related diseases in the province.

Table 3.5.2 Reported Cases and Deaths of Notifiable Water Related Diseases in 1998

Rate: 1/100,000

Diseases	Morbidity		Mortality		Infant Mortality	
	Number	Rate	Number	Rate	Number	Rate
Water-borne						
1. Typhoid/Parathyphoid	79	25				
2. Diarrhea	21,922	6,903	105	33	32	10
3. Viral hepatitis	70	22				
4. Gastro-enteritis			105	33		
Water-washed						
1. Intestinal parasitism	73	23				
2. Conjunctivitis	1,566	493				
3. Skin disease		38				
4. Scabies	1,134	357				
Water vector	121					
1. Dengue fever	1,588	500			6	2

3.5.3 Health Facilities and Practitioners

Present facilities serving the health care of the populace are 13 hospitals, 20 rural health units and 98 barangay health stations. The ratios of the population to these facilities and to the health practitioners are lower compared to the national average figures. This indicates that the province has better access to these facilities/practitioners (refer to Table 3.5.1 number and ratio of population to health facilities and/or medical practitioners, Supporting Report).

3.6 Environmental Conditions

3.6.1 General

Environmental issues and problems directly affecting the sector and/or how the sector affects these environmental concerns are dealt with in this sub-section. Specifically, the problems of water pollution and solid waste disposal spawned by rapid population growth and increasing industrial and economic activities are discussed. These problems put a strain on the provincial water resources and hinder their optimum utilization.

3.6.2 Water Pollution

There are no existing sanitary sewerage systems in the province. Majority of the drainage facilities in all municipalities is open canals or ditches. The rivers and streams function as the drainage system. These rivers receive the domestic wastewater and storm water collected by the segmented drainage facilities in urban centers or poblacions (refer to the types of drainage facilities in Table 3.6.1, Supporting Report).

A major water pollution source in urban areas is domestic wastewater. Graywater generated by households is simply allowed to discharge into nearby channels. Effluent from septic tanks or cesspools is also flowing into the streams. The other major pollutant is dumped refuse that finds its way to the river systems during rain or is thrown indiscriminately into the rivers. In rural areas, natural assimilation of the river may be expected to purify organic substances. However, pollution or contamination is anticipated caused by agricultural activities especially with reference to fertilizers and pesticides.

The manufacturing establishments are identified as potential pollution sources in the province if no control measures are in place. The rivers must be protected and conserved for their intended or beneficial use. However, as of now, the rivers in the province have not been classified as to their usage by the Department of Environment and Natural Resources (refer to gen-

eral information in Table 3.6.2 DENR Water Quality Criteria/Water Usage and Classification, Supporting Report).

3.6.3 Solid Waste Disposal

Of the 19 municipalities, 13 have municipal refuse collection and disposal services as of 1998 (details are referred to Table 3.6.1, Data Report). These municipalities have 1 to 2 units of open dump truck. Only the capital town of Maasin has one unit of closed type truck. In the province, 15% of the households is served, while the majority (85%) is unserved. Table 3.6.1 reflects the manner of solid waste collection and disposal, and service coverage by municipality in 1996.

Open dumping is commonly practiced by the LGUs as disposal of solid wastes. The dumped refuse is usually burned or left unattended. Some significant negative effects associated with this unsanitary method are surface and groundwater pollution, air pollution, scattered solid waste, breeding grounds for insects, rodents and other disease vectors and fire hazard. At the household level, unserved households by the LGUs primarily depend on individual waste disposal such as dumping in vacant lots or body of water, burying and composting.

Table 3.6.1 Municipal Solid Waste Collection and Disposal, and Service Coverage, 1998

Name of Municipality	Number of Households 1998	With Service						Without Service				Percentage of Households Served	Percentage of Households Unserved
		Number of Collection Trucks			Disposal			Manner of Disposal (Number of Household)					
		Open Dump Trucks	Closed Type Trucks	Total Units	Number of Households Served by Open Dump Site	Number of Households Served by Sanitary Landfill	Total Households Served	Dumping (Land and Water)	Burying	Composting	Total Households Unserved		
Anahawan	1,360							810		548	1,358		100
Bontoc	4,690	1		1	440		440	540	1,924	1,784	4,248	9	91
Hinunangan	4,835							610	3,847	377	4,834		100
Hinundayan	2,276	1		1	170	556	726	20		1,530	1,550	32	68
Libagon	2,180							342		1,836	2,178		100
Liloan	3,509	1		1	598		598	1,598		1,309	2,907	17	83
Limasawa	1,022							581		441	1,022		100
Maasin (Capital)	13,281	1	1	2	5,298		5,298	1,624	4,912	1,447	7,983	40	60
Macrohon	4,162							2,051	1,370	741	4,162		100
Malitbog	3,528	2		2	639		639	1,239		1,650	2,889	18	82
Padre Burgos	1,488							1,343	50	95	1,488		100
Pintuyan	1,617							699		918	1,617		100
Saint Bernard	4,375	1		1	337		337	2,831	337	870	4,038	8	92
San Francisco	2,033	1		1	210		210	156	346	1,318	1,820	10	90
San Juan (Cabalian)	2,470	2		2	639		639	150	1,505	175	1,830	26	74
San Ricardo	1,462							757		705	1,462		100
Silago	2,113							200	300	1,613	2,113		100
Sogod	6,290	2		2	1,166		1,166		670	4,452	5,122	19	81
Tomas Oppus	2,550							110	1,381	1,058	2,549		100
Provincial Total	65,241	12	1	13	9,497	556	10,053	15,661	16,642	22,867	55,170	15	85

Chapter 4

EXISTING FACILITIES AND SERVICE COVERAGE

4. EXISTING FACILITIES AND SERVICE COVERAGE

4.1 Water Supply

4.1.1 General

Existing water supply facilities and conditions were surveyed by municipality under the category of urban and rural areas (as of June 1999 and regarded as a figure in 1998). Facilities are classified into three service levels, of which Level I facilities are further classified into safe and unsafe for drinking purpose.

The percentages of service coverage by different service level were estimated covering urban and rural areas by municipality. The served population is defined as "population served adequately with access to safe water sources/facilities." The rest of the population with unsafe sources/facilities and without access to water supply facilities was then defined as "underserved population" and "unserved population," respectively. The service coverage was figured out using estimated population in 1998.

Service profile and operating conditions of existing facilities are summarized by service level to come up with problem areas and need of rehabilitation to reflect in the development plan.

As a provincial total, approximately 73% of the present population (of which 27% in urban area and 73% in rural area) is considered as adequately served (refer to 4.1, Supporting Report for the detailed study). Under the area classification, 77% of urban population and 71% of rural population have access to safe water sources/facilities, while the rest is underserved or unserved. About 64,500 persons or 28% of the served population depend on Level I facilities, while about 165,000 persons or 72% are served by Level III and/or Level II systems.

4.1.2 Types of Facilities and Definition of Service Level Standard

(1) Composition of water supply system/facility

The NSMP defines service level and system components of the water supply systems/facilities as shown in Table 4.1.1. NEDA Board Resolution No. 12 (s. 1995) also provides the approved definition of terms relative to water supply including levels of service (refer to 4.1.2 Data Report). These terms are to be adopted by all government agencies including LGUs.

Table 4.1.1 Composition of Water Supply System/Facility by Service Level

Description	Level I (Point Source Facility)	Level II (Communal Faucet System)	Level III (Individual House Connection)
1. Water Source	Drilled/driven shallow well Drilled/driven deep well Dug well Spring Rain collector	Drilled shallow/deep well Spring Infiltration gallery	Drilled deep well Spring Infiltration gallery Surface water intake
2. Water Treatment	Generally none. Disinfection of wells is conducted periodically by local health authorities. Iron removal facilities are provided in problem areas.	Generally none	Disinfection is provided. Systems with surface water source have series of water treatment facilities.
3. Distribution	None	Piped system provided with reservoir/s	Piped system provided with reservoir/s and pumping facilities.
4. Delivery & Service Level	At point (within 250m radius)	Communal faucet (within 25m radius)	Individual house connection/household tap
5. Consumption Rate (Adequately Served)	At least 20 lpcd	At least 60 lpcd	At least 100 lpcd

(2) Safe and unsafe classification of water sources

DOH has classified Level I water source facilities as safe (reliable water source) and unsafe sources/facilities based on the National Standard for Drinking Water (NSDW).

Safe source: Protected deep well, protected shallow well, improved/covered dug well and developed spring

Unsafe source: Unprotected deep well, unprotected shallow well, open dug well, undeveloped/unprotected spring and rainwater collector

Water sources other than the above, such as untreated surface water of rivers, lakes and ponds are also considered unsafe sources. On the other hand, Levels II and III water supply systems are regarded to have safe/reliable sources with provision of adequate treatment.

(3) Service level standard

The NSMP and NEDA Resolution No. 12 define "adequate service level" by different water supply system. Improvement in the number of households per water source/facility may be expected for Level I service in the future. On the contrary, the number of households served by a unit of private/public source is sometimes beyond the standard on a current basis.

Level III: 1 household/connection

Level II: 5 (4 to 6) households/communal faucet

Level I: 15 households/point source
1 household/private well

4.1.3 Level III Systems

Level III (individual house connection) systems at municipal level are usually established and operated by WD under the technical and financial assistance of LWUA. Some LGUs also implement and operate Level III systems commonly at municipality/barangay level.

There are 36 Level III systems in the province being operated under a water district or a municipal government as shown in Table 4.1.2 together with their service coverage in 1998 (details are referred to in Table 4.1.1, Supporting Report). These are:

- 2 water districts in the municipalities of Maasin and Sogod;
- 13 municipal waterworks in the municipalities of Anahawan, Bontoc, Hinunangan, Hinundayan, Libagon, Liloan, Malitbog, Padres Burgos, Pintuyan, Saint Bernard, San Francisco, San Ricardo and Tomas Oppus. ;
- 21 barangay waterworks in Bontoc (3 systems), Hinunangan, Macrohon (4 systems) and Silago (13 systems).

The Maasin Water District is the largest system in the province covering 10 urban and 5 rural barangays with served population of about 16,000. Its water source is a combination of 2 groups of springs, surface water from Canlited River and 4 deep wells. Total discharge of spring sources is 2,800 m3/d. Surface water is treated using slow sand filters with a production capacity of 350 m3/d. Deep wells are used for supplementary water source at present. The WD practices scheduled water supply due to insufficiency of water sources and capacity of the facilities especially during dry season. It is now undertaking the rehabilitation of spring intake box and the construction of water treatment plant/pipelines. For the long-term plan, the WD is seeking system expansion that will tap a spring source at Bolok-bolok.

Sogod WD is the second largest system in the province covering 5 urban and 4 rural barangays in the municipality of Sogod using spring water. The current served population is about 15,000, but the supply of water is insufficient during dry season.

The other 34 waterworks managed by the LGUs/RWSAs adopt the combined system with communal faucets using spring/deep well sources. At present, their served population range from 100 and 8,600. Some of these practice scheduled water supply due to insufficient water sources and/or inadequate capacity of existing facilities. Improvement/rehabilitation of transmission/distribution pipes together with augmentation of water source are current issues for these systems. Water quality examination is also a common issue since the current practice is very limited in sampling frequencies and items to be examined.

While the remaining 2 municipalities of Limasawa and San Juan have no Level III system/s both in urban and rural area at present.

Table 4.1.2 Information on Existing Level III System

Name of Municipality	Name of Operating Body	Water Consumption			Service Coverage								
		Type of Water Source	Water Consumption (cu.m/day)	Domestic Supply (%)	No. of Brgys. Served			No. of Household Served			No. of Population Served		
					Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Anahawan	Anahawan WWS	SP	*244	100	3	4	7	585	360	945	1,483	955	2,438
Bontoc	Bontoc WWS	DW/SP	198	100	5	1	6	315	4	319	1,068	22	1,090
	Mahayahay WS	SP	29	100		1	1		40	40		240	240
	PAWASA	SP	71	100		1	1		150	150		706	706
	Brgy. San Vicente	SP	11	100		1	1		32	32		192	192
	Municipal Total		553	100	5	4	9	315	226	541	1,068	1,160	2,228
Hinunangan	Hinunangan	SP	1,563	100	2	19	21	302	2,245	2,547	1,226	5,638	6,864
	Manlico	SP	*46	100		1	1		93	93		459	459
	Municipal Total		1,609	100	2	20	22	302	2,338	2,640	1,226	6,097	7,323
Hinundayan	Hinundayan	SP	*360	100	4	8	12	846	661	1,507	1,270	2,328	3,598
Libagon	Libagon WS	SP	*127	100	2	2	4	230	322	552	409	859	1,268
Liloan	Liloan		55	100	1	1	2	590	65	655	1,075	349	1,424
Maasin (Capi-	Maasin WD	SP	1,509	80		14	14		2,194	2,194	10,815	5,210	16,025
Macrohon	Amparo WS		*27	100		1	1		180	180		269	269
	Ichon	SP	*24	100		1	1		586	586		243	243
	San Roque WWS	SP	4,425	91	1	3	4	205	30	235	340	285	625
	San Vicente	SP	337	78	4	3	7	479		479	1,775		1,775
	Municipal Total		6,864	94	5	8	13	684	796	1,480	2,115	797	2,912
Malitbog	Malitbog WW	DW	736	50	4		4	198		198	1,240		1,240
Padre Burgos	Padres Burgos		684	96	2	2	4	446	188	634	2,065	1,123	3,188
Pintuyan	Pintuyan WWS	SP	2,315	100	3	18	21	85	377	462	283	889	1,172
Saint Bernard	Mun. WWS	SP	*838	100	3	5	8	360	521	881	3,400	4,976	8,376
San Francisco	San Francisco WW	SP	*184	100	3		3	318		318	1,844		1,844
San Ricardo	San Ricardo	SP	*161	100	1	2	3	153	223	376	487	1,120	1,607
Silago	Balagawan	SP	*36	100		1	1		66	66		364	364
	Catmon	SP	*7	100		1	1		14	14		68	68
	Hingatungan	SP	*96	100		1	1		161	161		961	961
	Imelda	SP	*8	100		1	1		14	14		84	84
	Katipunan	SP	*20	100		1	1		50	50		201	201
	Laguna	SP	*35	100		1	1		69	69		350	350
	Mercedes	SP	*31	100		1	1		174	174		309	309
	Puntana WWS	SP	*82	100	1		1	324		324	824		824
	Salvacion	SP	*24	100		1	1		47	47		237	237
	Sap-ang	SP	*14	100		1	1		28	28		139	139
	Sudmon	SP	*19	100		1	1		38	38		191	191
	Tuba-on	SP	*15	100		1	1		30	30		148	148
	Tubod	SP	*34	100		1	1		68	68		338	338
	Municipal Total		5,339	97	1	12	13	324	759	1,083	824	3,390	4,214
Sogod	Sogod WD	SP	*1,517	100	5	8	13	1,137	1,944	3,081	5,583	9,584	15,167
Tomas Oppus	Tomas Oppus	SP	*77	100	2		2	35		35	771		771
Provincial Total			15,958	92	46	108	154	6,608	10,974	17,582	35,958	38,837	74,795

Note: 1. Type of Water Source: *DW* - Deep Well, *SP* - Spring
2. * - Estimated at 100 lpcd.

Table 4.1.3 Information on Water District

Name of Water District	Number of Connections						Production (cu. m/mon)	Accounted for Water (cu. m/mon)
	Domestic	Institutional	Commercial	Industrial	Total	Metered		
Maasin WD	1,811		383		2,194	2,194	75,180	45,270
Sogod WD	NA				NA		15,300	NA

4.1.4 Level II Systems

Level II (communal faucet) systems are designed to cater for barangay level water supply with limited service coverage and supply capacity. These systems have been implemented by different agencies (DPWH, DILG, LGUs) and promotes the use of spring sources. These are mostly operated by either the barangay councils or the associations.

There are 239 Level II systems in the municipalities of the province. Most of these systems are utilizing spring sources (235 systems), while only 4 systems use shallow, deep and dug wells (details are referred to in Table 4.1.2, Supporting Report). The municipality of Maasin has the largest number, 50 systems or 21% of the total as shown in Table 4.1.4 together with the service coverage in 1998.

Majority of the systems which replied to the questionnaire (187 systems out of the total 239 systems) regarding current water supply status, provide water for 12 to 24 hours a day.

Problem areas, both in managerial and technical aspects, identified on existing Level II systems and the necessary countermeasures for the improvement are discussed hereunder.

(1) Management practice

About 30% of the systems impose flat rate water charge of 5 to 20 Pesos/HH/month and the rest supplies water free of charge. Regarding repair works, most of them resorted to assistance of the MEO/CEO as needed. This fact shows that the current management practices will lead to any one of these systems to become non-operational sooner or later. This is because the financial savings to cope with future repair and depreciation of existing facilities are not duly considered under the current management practice. Meanwhile, cost recovery by the operating bodies is a prerequisite in sector management.

To attain financial and managerial sustainability, reinforcement of association or other operating body shall be promoted with reference to institutional development.

(2) Technical skill for O&M of facilities

Utilization of spring source usually leads to less attention to the daily O&M practice, owing to gravity flow of water to the service area. However, inappropriate care of spring box and pipeline results to various problems, e.g. turbid water, less water flow by clogging at spring box and pipeline, etc. Physical damage may also happen to the transmission line exposed on the ground in the mountainous area due to landslide, etc. associated with heavy rainfall, when proper protection of pipeline is not taken up.

Expansion of distribution line and installation of additional public faucets are usually undertaken without appropriate technical study on the capacities of water sources and distribution facilities, resulting to decrease of supply pressure and quantity.

To attain technical sustainability of existing facilities, an appropriate technical guidance and skills training for operating bodies shall be arranged by concerned agencies/LGUs.

It is also common that water quality examination is not adequately conducted.

Table 4.1.4 Information on Existing Level II System

Name of Municipality	Name of Operating Body	Service Coverage								
		No. of Brgys. Served			No. of Household Served			No. of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Anahawan	Calintaan BWSA		1	1		20	20		91	91
	Capacuhan BWSA		1	1		25	25		114	114
	Kagingkingan BWSA		1	1		25	25		114	114
	Mainit BWSA		1	1		20	20		91	91
	Manigawong		1	1		15	15		68	68
	Municipal Total		5	5		105	105		478	478
Bontoc	Anahao WS		1	1		39	39		219	219
	Catoogan WS		1	1		60	60		333	333
	Cawayan WWS		1	1		90	90		495	495
	Dao WS		1	1		52	52		259	259
	Hibagwan WWS		1	1		50	50		255	255
	Hilaan WS		1	1		300	300		1,650	1,650
	Malbago WS		1	1		99	99		545	545
	Mauylab WS		1	1		80	80		440	440
	Taa WS		1	1		106	106		576	576
	Municipal Total		9	9		876	876		4,772	4,772
Hinunangan	Bugho WS		1	1		20	20		91	91
	Calag-ilan WS		1	1		219	219		1,037	1,037
	Ilaya WS		1	1		74	74		340	340
	Ingan WS		1	1		190	190		114	114
	Libas WS		1	1		49	49		68	68
	Matin-ao WS		1	1		20	20		91	91
	Nava WS		1	1		356	356		1,406	1,406
	Nueva Esperanza WS		1	1		129	129		91	91
	Palongpong WS		1	1		15	15		68	68
	Pondol WS		1	1		30	30		137	137
	Sto. Niño II WS		1	1		170	170		228	228
	Tuburan WS		1	1		104	104		470	470
	Municipal Total		12	12		1,376	1,376		4,141	4,141
Hinundayan	Amaga BWSA		1	1		65	65		311	311
	Ambao BWSA		1	1		105	105		502	502
	Biasong BWSA		1	1		75	75		359	359
	Bugho BWSA		1	1		45	45		215	215
	Cabulisan BWSA		1	1		40	40		191	191
	Hubasan BWSA		1	1		85	85		406	406
	Plaridel WS		1	1		45	45		215	215

Table 4.1.4 Information on Existing Level II System

(cont'd)

Name of Municipality	Name of Operating Body	Service Coverage								
		No. of Brgys. Served			No. of Household Served			No. of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Himundayan	Sagbok BWSA		1	1		85	85		406	406
	Municipal Total		8	8		545	545		2,605	2,605
Libagon	Biasong WS		1	1		25	25		121	121
	Gakat,Nahaong and		3	3		190	190		920	920
	Libagon WS	2	2	4	60	140	200	300	678	978
	Magkasag WS		1	1		40	40		192	192
	Mayuga WS		1	1		80	80		387	387
	Otikon WS		1	1		15	15		73	73
	Pangi		1	1		30	30		145	145
	Municipal Total	2	10	12	60	520	580	300	2,516	2,816
Liloan	Anilao WW		1	1		20	20		95	95
	Bahay WS		1	1		20	20		95	95
	Cagbungalon-Gudan WS		2	2		50	50		237	237
	Caligangan WS		1	1		30	30		142	142
	Candayuman WS		1	1		20	20		95	95
	Catig WS		1	1		15	15		71	71
	Estela WS		1	1		20	20		95	95
	Guintoylan WS		1	1		20	20		95	95
	Magaupas WS		1	1		30	30		142	142
	Maugoc WS		1	1		20	20		95	95
	Pandan WS		1	1		20	20		95	95
	Pres. Roxas WS		1	1		30	30		142	142
	San Isidro WS		1	1		30	30		142	142
	San Roque WS		1	1		40	40		190	190
	Tabugon WS		1	1		20	20		95	95
	Municipal Total		16	16		385	385		1,826	1,826
Limasawa	Lugsongan BWSA		1	1		35	35		174	174
	Magallanes BWSA		1	1		30	30		149	149
	SARWASA		2	2		80	80		398	398
	Municipal Total		4	4		145	145		721	721
Maasin (Capital)	Abgao WWS	1		1	206		206	1,030		1,030
	Asuncion	1		1	143		143	715		715
	Badiang		1	1		127	127		635	635
	Basak		1	1		39	39		195	195
	Bato I		1	1		50	50		300	300
	Bato II		1	1		34	34		170	170
	Batuan		1	1		126	126		630	630
	Baugo		1	1		21	21		105	105
	Bogo		1	1		44	44		222	222
	Cabadiagan		1	1		59	59		356	356
	Cagnituan		1	1		52	52		314	314
	Cansirong		1	1		102	102		612	612
	Canturing		1	1		18	18		92	92
	Canyuom		1	1		67	67		400	400
	Combado	1		1	199		199	998		998
	Guadalupe	1		1	8		8	38		38
	Hanginan		1	1		79	79		395	395
	Hinapu Daku		1	1		89	89		539	539
	Hinapu Gamay		1	1		84	84		509	509
	Ibarra	1		1	134		134	670		670
	Lanao		1	1		55	55		275	275
	Libertad		1	1		47	47		285	285
	Libhu		1	1		118	118		590	590
	Lonoy		1	1		74	74		500	500
	Lunas		1	1		135	135		674	674
	Mahayhay		1	1		48	48		240	240
	Malapoc Norte		1	1		51	51		255	255
	Mambajao	1		1	43		43	218		218
	Manhilo		1	1		80	80		400	400
	Mantahan	1		1	93		93	464		464
	Matin-ao		1	1		41	41		209	209
	Nati		1	1		35	35		177	177
	Nonok Norte		1	1		57	57		285	285
	Nonok Sur		1	1		60	60		301	301
	Pansaan		1	1		37	37		183	183
	Pinaskuhan		1	1		55	55		278	278
	Rizal		1	1		87	87		435	435
	San Agustin		1	1		56	56		282	282
	San Isidro		1	1		21	21		103	103

Table 4.1.4 Information on Existing Level II System

(cont'd)

Name of Municipality	Name of Operating Body	Service Coverage								
		No. of Brgys. Served			No. of Household Served			No. of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Maasin (capital)	San Jose		1	1		9	9		46	46
	Soro-soro	1		1	39		39	197		197
	Sta. Cruz		1	1		74	74		369	369
	Sta. Rosa		1	1		14	14		70	70
	Sto. Niño		1	1		54	54		270	270
	Sto. Rosario		1	1		50	50		250	250
	Tagnipa	1		1	110		110	550		550
	Tam-is		1	1		55	55		275	275
	Tigbawan		1	1		63	63		316	316
	Tomoy-tomoy		1	1		25	25		123	123
	Tunga-tunga	1		1	14		14	68		68
	Municipal Total	10	40	50	989	2,392	3,381	4,948	12,665	17,613
Macrohon	Danao WWS		1	1		40	40		193	193
	Laray WWS		1	1		40	40		193	193
	San Joaquin WS		1	1		30	30		145	145
	San Roque WWS		2	2		70	70		338	338
	Sindangan WWS		1	1		60	60		290	290
	Sto. Niño WWS		2	2		85	85		411	411
	Macrohon WWS		2	2		90	90		435	435
	Municipal Total		10	10		415	415		2,005	2,005
Malitbog	Aurora BWSA		1	1		72	72		173	173
	Caaga BWSA		1	1		81	81		180	180
	Cadaruhan Norte BWSA		1	1		72	72		143	143
	Cadaruhan Sur BWSA		1	1		71	71		175	175
	Canaatan BWSA		1	1		55	55		184	184
	Fatima BWSA		1	1		23	23		104	104
	Guinabonan BWSA		1	1		43	43		113	113
	Iba BWSA		1	1		62	62		112	112
	Kauswagan BWSA		1	1		33	33		145	145
	Lambonao BWSA		1	1		83	83		207	207
	Mahayhay BWSA		1	1		77	77		110	110
	Maningning BWSA		1	1		59	59		207	207
	Maujo BWSA		1	1		128	128		241	241
	New Katipunan BWSA		1	1		44	44		139	139
	Pancil BWSA		1	1		60	60		148	148
	San Vicente BWSA		1	1		246	246		244	244
	Sangahon BWSA		1	1		131	131		101	101
	Sta. Cruz BWSA		1	1		175	175		214	214
	Sto. Niño BWSA		1	1		59	59		105	105
	Tigbawani BWSA		1	1		53	53		109	109
	Timba BWSA		1	1		105	105		145	145
	Municipal Total		21	21		1,732	1,732		3,299	3,299
Padre Burgos	Bunga WS		1	1		30	30		153	153
	Cantotang WS		1	1		35	35		179	179
	San Juan WS		1	1		20	20		102	102
	Sto. Rosario WS		1	1		35	35		179	179
	Municipal Total		4	4		120	120		613	613
Pintuyan	Badiang WWS		2	2		55	55		289	289
	Balongbalong WWS		1	1		25	25		131	131
	Buenavista WWS		1	1		10	10		53	53
	Bulawan WWS		1	1		25	25		131	131
	Catbawan WWS		1	1		25	25		131	131
	Caubang WWS		1	1		40	40		210	210
	Cogon WWS		1	1		35	35		184	184
	Dan-an WWS		1	1		20	20		105	105
	Lobo WWS		1	1		15	15		79	79
	Mainit WWS		1	1		30	30		158	158
	Nva. Estrella Norte WWS		1	1		15	15		79	79
	Nva. Estrella Sur WWS		1	1		10	10		53	53
	P.D. Equipilag WWS		1	1		15	15		79	79
	Son-ok I WWS		1	1		15	15		79	79
	Son-ok II WWS		1	1		15	15		79	79
	Tautag WWS		1	1		25	25		131	131
	Municipal Total		17	17		375	375		1,971	1,971
Saint Bernard	Ayahag BWSA		1	1		160	160		792	792
	Carnaga WWS		1	1		80	80		396	396
	Guinsaugon BWSA		1	1		15	15		74	74
	Himos-onan BWSA		2	2		55	55		272	272
	Magatas BWSA		1	1		45	45		223	223

Table 4.1.4 Information on Existing Level II System

(cont'd)

Name of Municipality	Name of Operating Body	Service Coverage								
		No. of Brgys. Served			No. of Household Served			No. of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Saint Bernard	Panian BWSA		1	1		20	20		99	99
	Sta. Cruz WWS		1	1		15	15		74	74
	Sug-angon WWS		1	1		65	65		322	322
	Municipal Total		9	9		455	455		2,252	2,252
San Francisco	Anislagon WS		1	1		30	30		137	137
	Bongawisan WS		1	1		15	15		68	68
	Bongbong WS		1	1		65	65		296	296
	Cabayag WS		1	1		15	15		68	68
	Cuasi WS		1	1		45	45		205	205
	Gabi WS		1	1		15	15		68	68
	Habay WS		1	1		20	20		91	91
	Malico WS		1	1		35	35		159	159
	Marayag WS		1	1		35	35		159	159
	Pasanon WS		1	1		25	25		114	114
	Pinamudlan WS		1	1		70	70		318	318
	Punta WS		1	1		15	15		68	68
	Sta. Cruz WS		1	1		45	45		205	205
	Sta. Paz Norte WS		1	1		45	45		205	205
	Sta. Paz Sur WS		1	1		15	15		68	68
	Sudmon WS		1	1		50	50		228	228
	Tinaan WS		1	1		30	30		137	137
	Tuno WS		1	1		100	100		455	455
	Municipal Total		18	18		670	670		3,049	3,049
San Juan (Cabatian)	Agay-ay BWSA		1	1		55	55		193	193
	Basak BWSA		1	1		105	105		422	422
	Bobon A BWSA		1	1		95	95		376	376
	Bobon B BWSA		1	1		70	70		262	262
	Duyanog BWSA		1	1		35	35		101	101
	Garrido BWSA		1	1		95	95		376	376
	Minoyho BWSA		1	1		75	75		285	285
	Osao BWSA		1	1		210	210		480	480
	Pong-oy BWSA		1	1		95	95		376	376
	San Roque BWSA		1	1		40	40		125	125
	San Vicente BWSA		1	1		95	95		376	376
	Sonoje BWSA		1	1		50	50		170	170
	Sta. Filomena BWSA		1	1		65	65		239	239
	Sua BWSA		1	1		210	210		481	481
	Timba BWSA		1	1		30	30		137	137
	Municipal Total		15	15		1,325	1,325		4,399	4,399
San Ricardo	Esperanza WS		1	1		90	90		452	452
	Kinachawa WS		1	1		40	40		201	201
	Lo-oc WS		1	1		20	20		100	100
	Malingin Mun. WS		3	3		15	15		75	75
	Pinut-an WS		1	1		90	90		452	452
	Private Land WS		1	1		20	20		100	100
	San Ramon WS		1	1		35	35		176	176
	Saub WS		1	1		20	20		100	100
	Timba-Camang WS		2	2		75	75		377	377
	Municipal Total		12	12		405	405		2,033	2,033
Silago	Balagawan		1	1		80	80		270	270
	Catmon		1	1		25	25		116	116
	Hingatungan		1	1		45	45		208	208
	Imelda		1	1		10	10		46	46
	Katipunan		1	1		10	10		46	46
	Laguna		1	1		30	30		139	139
	Mercedes		1	1		20	20		93	93
	Pob. District I	1		1	35		35	83		83
	Pob. District II	1		1	52		52	162		162
	Puntana		1	1		10	10		61	61
	Salvacion		1	1		45	45		223	223
	Sap-ang		1	1		155	155		528	528
	Sudmon		1	1		10	10		61	61
	Tuba-on		1	1		15	15		85	85
	Tubod		1	1		30	30		158	158
	Municipal Total	2	13	15	87	485	572	245	2,034	2,279
Sogod	Cabadbaran		1	1		20	20		97	97
	Hindangan		1	1		25	25		123	123
	Hipantag		1	1		15	15		74	74
	Kanangkaan		1	1		40	40		197	197

Table 4.1.4 Information on Existing Level II System

(cont'd)

Name of Municipality	Name of Operating Body	Service Coverage								
		No. of Brgys. Served			No. of Household Served			No. of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Sovcd	Libas		1	1		60	60		295	295
	Mabicay		1	1		40	40		197	197
	Magatas		1	1		60	60		296	296
	Matinao		1	1		20	20		97	97
	Milagroso		1	1		30	30		148	148
	Olisihan		1	1		40	40		197	197
	Pancho Villa		1	1		60	60		296	296
	San Juan		1	1		74	74		370	370
	San Miguel		1	1		25	25		123	123
	San Roque		1	1		15	15		74	74
	San Vicente		1	1		10	10		49	49
	Santa Maria		1	1		15	15		74	74
	Suba		1	1		175	175		863	863
	Tampoong		1	1		45	45		222	222
	Zone III	1		1	25		25	123		123
	Municipal Total	1	18	19	25	769	794	123	3,792	3,915
Tomas Oppus	Camansi		1	1		15	15		55	55
	Canibite					50	50		165	165
	Canlupao		3	3		17	17		56	56
	Caranaga		1	1		30	30		109	109
	Cawayan		1	1		40	40		145	145
	Higosoan		1	1		25	25		91	91
	Hinagtikan		1	1		10	10		37	37
	Hinapo		1	1		25	25		71	71
	Hugpa		1	1		30	30		80	80
	Iniguihan		1	1		20	20		63	63
	Looc		1	1		75	75		273	273
	Maanyag		1	1		25	25		71	71
	Mag-ata		1	1		205	205		745	745
	Maslog		1	1		520	520		2,085	2,085
	Ponong		1	1		155	155		552	552
	Rizal		1	1		87	87		435	435
	San Miguel		1	1		55	55		160	160
	San Isidro		1	1		21	21		103	103
	Municipal Total		22	22		1,606	1,606		6,054	6,054
Provincial Total		15	263	278	1,161	14,701	15,862	5,616	61,225	66,841

4.1.5 Level I Facilities

Level I facilities (point source) are common in rural barangays. Major facilities are different types of wells equipped with hand-pumps or developed spring with transmission line and one communal faucet.

Level I facilities are classified in terms of safe and unsafe sources referring to the definition of DOH and the data from PHO as presented in Table 4.1.5 (details are referred to the Supporting Report). Served population in 1998 is also estimated as shown in the same table.

Of the 3,685 operational Level I facilities, 71% are shallow wells. According to the study on safe/unsafe percentage for shallow well, 30 - 80% of the shallow wells are assumed to be unsafe by municipality (details are referred to the Supporting Report). All deep wells, covered/improved dug wells and developed springs are regarded as safe water sources. By ap-

Table 4.1.5 Information on Existing Level I Facilities

Name of Municipality	Number of Safe Water Sources					Number of Unsafe Water Sources					Served by Safe Source					
											Number of Household			Number of Population		
	Deep Well	Shallow Well	Covered/ Improved Dug Well	Developed Spring	Total	Shallow Well	Open Dug Well	Undeveloped Spring	Rain Water Collector	Total	Urban	Rural	Total	Urban	Rural	Total
Anahawan	3			8	11							287	287		1,306	1,306
Bontoc	56	30		7	93	70				70	92	1,098	1,190	458	5,590	6,048
Hinunangan	14	101	110	26	251	67	112			179	43	1,219	1,262	201	5,556	5,758
Hinundayan	12	2	11	2	27	6	20		3	29	130		130	615		615
Libagon		39	1	10	50	17	2			19	96	258	353	478	1,247	1,725
Liloan	1	3		5	9	2				2	583	1,459	2,042	2,844	6,916	9,759
Limasawa	4	60		1	65	242	13			255	74	108	182	360	538	898
Maasin (Capital)	73	184	66	55	378	275			1	276	1,754	471	2,225	8,488	2,223	10,711
Macrohon	90	65		22	177	120				120	709	532	1,241	3,369	2,568	5,938
Malitbog	71	278		29	378	417				417	173	968	1,141	889	5,139	6,028
Padre Burgos	3	31		7	41	20				20	58	368	426	302	1,880	2,182
Pintuyan				3	3											
Saint Bernard	18	13			31	8				8		1,451	1,451		7,181	7,181
San Francisco	1	10	7	32	50	40	82			122	25	125	149	112	567	679
San Juan (Cabalian)	19	14			33	56	6			62	377	193	570	1,716	885	2,601
San Ricardo	1	1			2	1				1		22	22		109	109
Silago	9	2		24	35	10				10	177	183	360	833	845	1,678
Sogod	26	154		6	186	231				231		178	178		879	879
Tomas Oppus	8	15	3	2	28	15	2			17	78		78	389		389
Provincial Total	409	1,000	198	239	1,846	1,598	237		4	1,839	4,369	8,918	13,286	21,055	43,428	64,483

plying the unsafe percentage to the number of shallow wells for each municipality, 1,849 Level I facilities are classified as safe sources, while 1,836 facilities are unsafe sources.

Percentage shares between public and private Level I facilities for rural water supply is 42% and 58%, respectively. The share of developed springs in public facilities is 17% (details are referred to the Supporting Report).

Problem areas observed on Level I facilities and the necessary countermeasures for the improvement are summarized in terms of potability and functionality.

(1) Unsafe water sources

Most of the sources declared as unsafe are driven shallow wells which are unprotected against seepage of surface water and are usually located in nearby potential pollution sources, such as septic tank and piggery. (The Code on Sanitation requires a minimum distance of 25m between water source and pollution sources.)

These shallow wells shall be provided with concrete apron on the ground surface and proper drainage facility at the surrounding area. Relocation of wells or pollution sources may be another countermeasure. For new construction of shallow wells, proper site selection and appropriate construction method shall be applied together with periodic monitoring of water quality.

(2) Non-functioning/abandoned wells

There are several non-functioning public wells in the province as shown in Table 4.1.6. Most of the beneficiaries are not aware of the manner for O&M of the facilities. A considerable number of public wells are abandoned/non-functional due to lack of O&M, dried-up of wells and other reasons. In most cases, the operating bodies for the facilities are not organized or non-functioning. Unauthorized private tapping to transmission lines (spring water source) are also found at some Level I facilities, which caused insufficient water supply/water pressure.

Beneficiaries still rely on the LGUs even for a simple replacement of parts (such as gasket). As for the existing public Level-I, the barangay council takes care of O&M using the IRA allotted to the barangay. In cases where major repair is required (e.g., replacement of hand pump unit/major parts), the barangay council submits a barangay resolution of request for the repair to the municipal government. The municipal government assists them in case financial sources are secured. The beneficiaries contribute free labor.

Considering the current situation of the beneficiaries, LGUs shall lead them to recognize the need of formation of association and participation for sound O&M of the facilities. Information dissemination to beneficiaries is a requisite.

Table 4.1.6 Operating Status of Existing Wells in the Province

Operating Status	Unit	Public Facility		Private Facility		Total
		Deep Well	Shallow Well	Deep Well	Shallow Well	
Functioning	No.	289	905	120	1,693	3,007
	Percent	72%	89%	92%	95%	91%
Non-Functioning	No.	113	107	10	82	312
	Percent	28%	11%	8%	5%	9%
Total Number		402	1,012	130	1,775	3,319

Note: Number of non-functioning wells includes abandoned wells, but details in number and reasons are not available.

Among others, deep wells usually necessitate repair/replacement of mechanical parts and redevelopment of the well itself. Apart from the same problems as deep wells, shallow wells have primary disadvantages such as the use of shallow aquifer which is easily affected by surrounding environmental conditions and the simple construction method applied (driving well point) that makes rehabilitation works difficult.

To prolong the service life of public deep wells, periodic check-up entailing preventive maintenance and redevelopment of wells are to be performed. Meanwhile, proper site selection and protection of well sources are requisites for shallow wells.

4.1.6 Water Supply Service Coverage

According to the definition of DOH in terms of safe and unsafe sources, service coverage was studied under "served", "underserved" and "unserved" categories.

The present population of the municipalities as of 1998, base year for planning purpose, was estimated referring to the NSO population census results (1903 to 1995, conducted 10 times), the 1995 Census-based National and Regional Population projection prepared by the NSO and the 1995 Census-based Regional and Provincial population projection prepared by the NEDA Regional Office VIII. In addition, the population distribution in 1995 census by urban and rural barangay prepared by the NSO was adjusted to meet actual conditions in the classification of barangays. Details are referred to Section 8.3.1 Population Projection.

Water supply service coverage by service level is estimated for urban and rural areas covering all municipalities under the following conditions and assumptions:

- Service percentage/population by Level III and Level II systems was estimated based on the questionnaire survey results.

- Unserved population was estimated using the percentages of unserved households to the total number of households by urban and rural area based on the questionnaire survey results and the 1990 population census data; "Households by Main Source of Drinking Water and City/Municipality".
- The rest of the population was considered served by Level I facilities assuming that 50% of private facilities was shared by neighbors to augment insufficiency of public facilities.

The average number of households sharing at each Level I public/private facility was calculated at an average of 8 households/facility under the above assumptions (details are referred to the Supporting Report).

Table 4.1.7 presents the profile of the service coverage in terms of served, underserved and unserved. As a provincial total, 73% of the population is adequately served (77% of urban population and 71% of rural population).

The percentage of underserved population is estimated at 11% of the total population (15% of urban population and 10% of rural population) who are depending on unsafe sources/facilities.

The provincial service coverage at present is exhibited in Figure 4.1.1 (details are referred to the Supporting Report).

Among the different service levels, Level III systems combined with communal faucets take a major part of service coverage in urban water supply in the municipalities such as Anahawan, Hinunangan, Maasin, Malitbog, Padre Burgos, Saint Bernard, San Francisco, San Ricardo, Silago, Sogod and Tomas Oppus.

Also, Level II systems have a major share in rural water supply in Hinundayan, Libagon, Maasin, Macrohon, San Francisco, San Juan, San Ricardo and Tomas Oppus.

On the other hand, Level I facilities predominate in limited municipalities such as Liloan.

Percentage shares of population coverage by Level I public and private facilities in rural water supply are estimated at 96% and 4%, respectively (refer to Supporting Report for details).

Taking into account the municipal service coverage, of the 19 municipalities of the province, 11 are above the average provincial service coverage of 73%. The highest coverage is seen in Silago at 93%, followed by Hinundayan (92%), Liloan (89%), Padre Burgos (86%), Hinunangan (84%), Libagon and Saint Bernard (83%) and Macrohon (80%).

Table 4.1.7 Water Supply Service Coverage by Municipality

Name of Municipality	Area	Population (1998)	Population Coverage							Percentage of Population Coverage						
			Served by Safe Source				Underseved/Unserved			Served by Safe Source				Underseved/Unserved		
			Level III	Level II	Level I	Total	Unsafe Source	Unserved	Total	Level III	Level II	Level I	Total	Unsafe Source	Unserved	Total
Anahawan	Urban	2,805	1,483	186		1,669		1,136	1,136	53	7		60		40	40
	Rural	3,473	955	1,016	1,306	3,277		196	196	27	29	38	94		6	6
	Total	6,278	2,438	1,202	1,306	4,946		1,332	1,332	39	19	21	79		21	21
Bontoc	Urban	3,780	1,068	1,012	458	2,538	978	265	1,242	28	27	12	67	26	7	33
	Rural	20,015	1,160	5,486	5,590	12,236	3,044	4,735	7,779	6	27	28	61	15	24	39
	Total	23,795	2,228	6,498	6,048	14,774	4,022	4,999	9,021	9	27	25	62	17	21	38
Hinunangan	Urban	1,575	1,226		201	1,427	111	37	148	78		13	91	7	2	9
	Rural	20,502	6,097	5,463	5,556	17,116	2,782	604	3,386	30	27	27	83	14	3	17
	Total	22,077	7,323	5,463	5,758	18,544	2,893	640	3,533	33	25	26	84	13	3	16
Hinundayan	Urban	4,307	1,270	1,782	615	3,667	598	42	640	29	41	14	85	14	1	15
	Rural	6,523	2,328	3,990		6,318		205	205	36	61		97		3	3
	Total	10,830	3,598	5,772	615	9,985	598	247	845	33	53	6	92	6	2	8
Libagon	Urban	1,450	409	300	478	1,187	198	65	263	28	21	33	82	14	4	18
	Rural	9,146	859	5,532	1,247	7,638	375	1,133	1,508	9	60	14	84	4	12	16
	Total	10,596	1,268	5,832	1,725	8,825	572	1,198	1,771	12	55	16	83	5	11	17
Liloan	Urban	4,557	1,075	40	2,844	3,959	588	10	598	24	1	62	87	13	0	13
	Rural	12,204	349	3,692	6,916	10,957	1,061	187	1,247	3	30	57	90	9	2	10
	Total	16,761	1,424	3,732	9,759	14,915	1,649	197	1,846	8	22	58	89	10	1	11
Limasawa	Urban	1,229			360	360	839	30	869			29	29	68	2	71
	Rural	3,831		721	538	1,259	2,027	545	2,572		19	14	33	53	14	67
	Total	5,060		721	898	1,619	2,866	575	3,441		14	18	32	57	11	68
Maasin (Capital)	Urban	30,316	10,815	4,948	8,488	24,251	5,127	938	6,065	36	16	28	80	17	3	20
	Rural	33,120	5,210	12,763	2,223	20,196	854	12,070	12,924	16	39	7	61	3	36	39
	Total	63,436	16,025	17,711	10,711	44,447	5,981	13,008	18,989	25	28	17	70	9	21	30
Macrohon	Urban	6,698	2,115		3,369	5,484	1,109	104	1,214	32		50	82	17	2	18
	Rural	13,290	797	7,101	2,568	10,466	965	1,859	2,824	6	53	19	79	7	14	21
	Total	19,988	2,912	7,101	5,938	15,951	2,074	1,963	4,037	15	36	30	80	10	10	20
Malitbog	Urban	2,882	1,240		889	2,129	568	186	753	43		31	74	20	6	26
	Rural	15,757		3,352	5,139	8,491	4,127	3,139	7,266		21	33	54	26	20	46
	Total	18,639	1,240	3,352	6,028	10,620	4,694	3,325	8,019	7	18	32	57	25	18	43
Padre Burgos	Urban	2,543	2,065		302	2,367	176		176	81		12	93	7		7
	Rural	5,121	1,123	1,226	1,880	4,229	857	35	892	22	24	37	83	17	1	17
	Total	7,664	3,188	1,226	2,182	6,596	1,034	35	1,068	42	16	28	86	13	0	14

Table 4.1.7 Water Supply Service Coverage by Municipality

Name of Municipality	Area	Population (1998)	Population Coverage							Percentage of Population Coverage						
			Served by Safe Source				Underseved/Unserved			Served by Safe Source				Underseved/Unserved		
			Level III	Level II	Level I	Total	Unsafe Source	Unserved	Total	Level III	Level II	Level I	Total	Unsafe Source	Unserved	Total
Pintuyan	Urban	1,048	283			283		765	765	27			27		73	73
	Rural	7,409	889	2,127		3,016		4,393	4,393	12	29		41		59	59
	Total	8,457	1,172	2,127		3,299		5,158	5,158	14	25		39		61	61
Saint Bernard	Urban	3,475	3,400			3,400		75	75	98			98		2	2
	Rural	18,085	4,976	2,350	7,181	14,507	2,480	1,099	3,578	28	13	40	80	14	6	20
	Total	21,560	8,376	2,350	7,181	17,907	2,480	1,174	3,653	39	11	33	83	12	5	17
San Francisco	Urban	2,222	1,844		112	1,956	121	146	266	83		5	88	5	7	12
	Rural	7,029		3,049	567	3,616	920	2,493	3,413		43	8	51	13	35	49
	Total	9,251	1,844	3,049	679	5,572	1,041	2,639	3,679	20	33	7	60	11	29	40
San Juan (Cabalian)	Urban	3,800			1,716	1,716	2,084		2,084			45	45	55		55
	Rural	7,490		4,399	885	5,284	2,165	41	2,206		59	12	71	29	1	29
	Total	11,290		4,399	2,601	7,000	4,249	41	4,290		39	23	62	38	0	38
San Ricardo	Urban	695	487			487		208	208	70			70		30	30
	Rural	6,569	1,120	3,991	109	5,220	40	1,309	1,349	17	61	2	79	1	20	21
	Total	7,264	1,607	3,991	109	5,707	40	1,517	1,557	22	55	2	79	1	21	21
Silago	Urban	2,168	824	384	833	2,041	108	19	127	38	18	38	94	5	1	6
	Rural	7,634	3,390	2,841	845	7,076	209	350	558	44	37	11	93	3	5	7
	Total	9,802	4,214	3,225	1,678	9,117	316	369	685	43	33	17	93	3	4	7
Sogod	Urban	8,841	5,583	123		5,706		3,135	3,135	63	1		65		35	35
	Rural	22,129	9,584	3,792	879	14,255	803	7,071	7,874	43	17	4	64	4	32	36
	Total	30,970	15,167	3,915	879	19,961	803	10,206	11,009	49	13	3	64	3	33	36
Tomas Oppus	Urban	1,932	771	342	389	1,502	200	229	430	40	18	20	78	10	12	22
	Rural	10,487		8,168		8,168		2,319	2,319		78		78		22	22
	Total	12,419	771	8,510	389	9,670	200	2,548	2,749	6	69	3	78	2	21	22
Provincial Total	Urban	86,323	35,958	9,117	21,055	66,130	12,803	7,390	20,193	42	11	24	77	15	9	23
	Rural	229,814	38,837	81,059	43,428	163,324	22,709	43,781	66,490	17	35	19	71	10	19	29
	Total	316,137	74,795	90,176	64,483	229,454	35,511	51,171	86,683	24	29	20	73	11	16	27

In contrast to the above, 8 municipalities are below the provincial average. The lowest is Limasawa at 32%, followed by Pintuyan (39%) and Malitbog (57%). The low coverage of these municipalities is due to the large number of unserved population.

4.2 Sanitation and Sewerage

4.2.1 General

The national strategy for sanitation and sewerage is demand-oriented. It aims to stimulate sustainable improvements in sanitation service coverage, public health and environmental pollution abatement. To achieve this goal, the Government has made investment choices based on demand and the extent to which choices contribute to efficiency and cost-effectiveness.

This sub-sector focuses on household toilets, school toilets and public toilets (public markets, bus/jeepney terminals and parks/playgrounds). The latest data from the PHO on household and public toilets as well as from DECS on school toilets were gathered by municipality. In case of household toilets, data were consolidated by urban and rural area. These facilities were classified into sanitary and unsanitary in terms of structure rather than the surrounding conditions.

The Code on Sanitation of the Philippines provides the minimum standards for services dealing with public health. Specifically, Chapter XVII on Sewage Collection and Disposal, Excreta Disposal and Drainage (Implementing Rules and Regulations, 1995) defines alternatives for on-site sanitation and sewage collection and disposal. At present, the development of sewerage systems, even in the urban centers of the province is not given priority because of the huge investment cost it entails.

In the NEDA Board Resolution No. 12 (series of 1995), definitions of approved types of sanitary toilets were outlined (refer to 4.1.2, Data Report). There were 4 approved types of sanitary toilets including the sanitary pit privy where water is not used but provided with cover to minimize the emission of foul odor and also to keep away flies and rodents. These definitions were applied in this Master Plan.

4.2.2 Types of Facilities and Definition of Service Level Standard

As set forth in the above-mentioned Resolution, the types of household toilet facilities commonly used are categorized into: 1) sanitary toilets - approved types of toilet facilities include

water-sealed pour flush or flush-type toilets either with receiving pit or septic tanks/vaults, and ventilated improved pit latrines and sanitary pit privy (dry type) considering its low construction cost especially in rural areas and in areas where water is scarce; and 2) unsanitary facilities - include the types of facilities used for receiving and disposing human waste which do not fall under the category of approved types of toilet facilities such as open pit privy and over-hung latrines (refer to Figure 4.2.1 DOH standard structure of a household toilet that meets the minimum requirements of a sanitary facility, Supporting Report).

In terms of service level, households are classified into: 1) served households - households with at least one (1) sanitary toilet; 2) underserved households - households with unsanitary toilets; and 3) unserved households - households without toilet. Coverage of adequately served households (with sanitary toilets) was estimated by urban and rural area of municipalities. The remaining households were considered as underserved or unserved. The service coverage was determined using the estimated number of households in 1998.

Service level standard for both elementary and secondary school toilets is translated in terms of: 1) served students - students who are adequately covered by the DECS standard ratio of one (1) unit per 40 students with access to sanitary toilets (number of sanitary toilet units multiplied by 40); and (2) underserved or unserved students - those with unsanitary and without toilet facilities, and students unserved (based on the standard ratio) even though they have access to sanitary toilets. Service coverage of adequately served students was estimated both for public and private schools by municipality. Figure 4.2.2, Supporting Report shows a standard structure of a school toilet facility adopted by the DOH through the JICA-DPWH and DOH Rural Environmental Sanitation Project.

For public toilets, the service level is classified into: 1) served - utilities that have at least one (1) sanitary toilet, and 2) underserved or unserved - utilities that have unsanitary or without toilet facilities. Service coverage of public utilities was estimated as a percentage of sanitary facilities to the total number of utilities. Figure 4.2.3, Supporting Report shows a standard structure of a public toilet facility adopted by the DOH

4.2.3 Sanitation Facilities and Service Coverage

(1) Household Toilets

The service coverage of sanitary toilets in the province is 82% of the total number of households. The rest is underserved or unserved. Of this, a high 98% is without toilet

facilities (refer to Table 4.2.1, Supporting Report and 4.2.3 Sanitation Facilities and Service Coverage, Data Report).

Municipalities that have higher service coverage than the provincial average of 82% are San Ricardo and Silago (96%), Tomas Oppus (95%), Hinundayan (93%), Hinunangan, Limasawa and Pintuyan, (92%), Anahawan, and Libagon (91%), Liloan (90%), San Francisco (86%), Malitbog and Saint Bernard (85%) and Macrohon (83%). On the other hand, the municipalities that registered the lowest service coverage are San Juan (62%), Sogod (66%), Maasin (72%), Bontoc (78%) and Padre Burgos (79%). It was observed that in municipalities that have high water supply service coverage (Hinundayan, Silago), high sanitation coverage occurs and correspondingly, in low water supply service coverage (San Juan, Bontoc), low sanitation coverage also occurs. This can be attributed to the fact that the development of water supply almost always follows the upgrading of the household sanitation facilities because of access to water.

In urban areas, approximately 76% of the total households are served. Higher served households of 84% exist in rural area. Table 4.2.1 shows the municipal breakdown in the number of urban and rural household toilets by category, and service coverage. Figure 4.2.1 reflects the provincial service coverage of household toilet facilities for urban and rural areas.

Even if high percentages of sanitary toilets are revealed in the urban areas, problems arise from the unsatisfactory disposal of the effluent from the septic tanks or the direct discharge of wastewater to the local drains. Generally, there is little concern about the unsatisfactory disposal of wastes once it is outside their dwelling units. Practically, almost all the households dispose their wastes in the manner that poses risks to public health. Sullage waste management is unheard of.

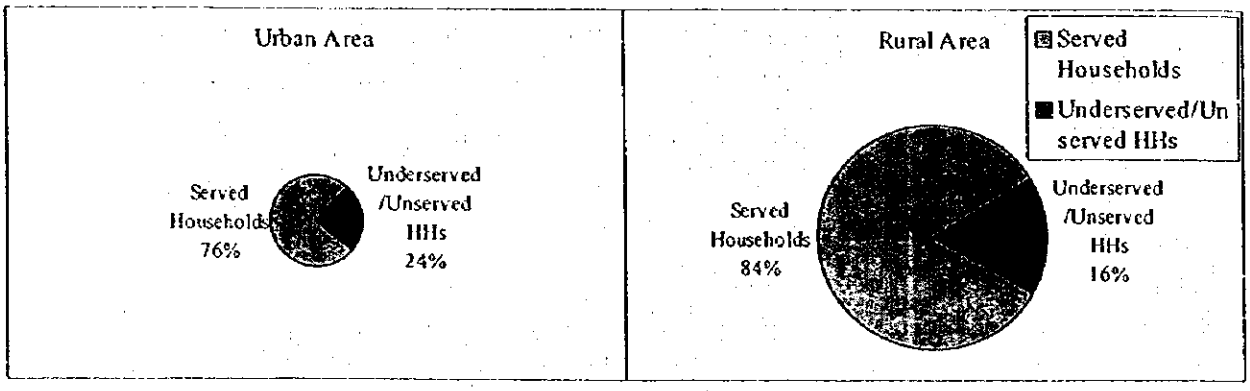
(2) School and Public Toilets

Toilet facilities in elementary and secondary schools for both public and private schools were investigated. The province has a total of 1,875 toilet units found in 367 schools. Sanitary toilets adequately serve 81% of the students. The rest, 19% is underserved or unserved. Meanwhile, sanitary toilets adequately serve about 84% of the public school students. Table 4.2.2 provides the number and service coverage of school toilet facilities.

Table 4.2.1 Sanitation Facilities and Service Coverage of Household Toilets, Urban and Rural, 1998

Municipalityy	Households, 1998			Household Toilets Facilities and Service Coverage											
				Urban				Rural				Municipal Total			
	Urban	Rural	Total	HHs Served by Sanitary Toilets		Underserved/ Unserved HHs		HHs Served by Sanitary Toilets		Underserved/ Unserved HHs		HHs Served by Sanitary Toilets		Underserved/ Unserved HHs	
				Number	% of HHs	Number	% of HHs	Number	% of HHs	Number	% of HHs	Number	% of HHs	Number	% of HHs
Anahawan	598	762	1,360	577	96	21	4	655	86	107	14	1,232	91	128	9
Bontoc	758	3,932	4,690	685	90	73	10	2,956	75	976	25	3,641	78	1,049	22
Hinunangan	339	4,496	4,835	289	85	50	15	4,176	93	320	7	4,465	92	370	8
Hinundayan	911	1,365	2,276	800	88	111	12	1,320	97	45	3	2,120	93	156	7
Libagon	290	1,890	2,180	277	96	13	4	1,697	90	193	10	1,974	91	206	9
Liloan	934	2,575	3,509	813	87	121	13	2,352	91	223	9	3,165	90	344	10
Limasawa	253	769	1,022	234	92	19	8	706	92	63	8	940	92	82	8
Maasin (Capital)	6,264	7,017	13,281	4,187	67	2,077	33	5,406	77	1,611	23	9,593	72	3,688	28
Macrohon	1,410	2,752	4,162	1,130	80	280	20	2,317	84	435	16	3,447	83	715	17
Malitbog	561	2,967	3,528	516	92	45	8	2,489	84	478	16	3,005	85	523	15
Padre Burgos	486	1,002	1,488	184	38	302	62	986	98	16	2	1,170	79	318	21
Pintuyan	206	1,411	1,617	142	69	64	31	1,347	95	64	5	1,489	92	128	8
Saint Bernard	721	3,654	4,375	614	85	107	15	3,092	85	562	15	3,706	85	669	15
San Francisco	488	1,545	2,033	386	79	102	21	1,358	88	187	12	1,744	86	289	14
San Juan (Cabalian)	835	1,635	2,470	500	60	335	40	1,026	63	609	37	1,526	62	944	38
San Ricardo	153	1,309	1,462	118	77	35	23	1,286	98	23	2	1,404	96	58	4
Silago	461	1,652	2,113	430	93	31	7	1,595	97	57	3	2,025	96	88	4
Sogod	1,801	4,489	6,290	1,406	78	395	22	2,767	62	1,722	38	4,173	66	2,117	34
Tomas Oppus	388	2,162	2,550	379	98	9	2	2,032	94	130	6	2,411	95	139	5
Provincial Total	17,857	47,384	65,241	13,667	76	4,190	24	39,563	84	7,821	16	53,230	82	12,011	18

Figure 4.2.1 Provincial Service Coverage of Household Toilet Facilities, 1998



The number of sanitary school toilets almost meets the service level standard of 40 students per sanitary facility. At present, the average ratio is 43 students per sanitary toilet. Some of school toilets constructed are not being used due to lack of water supply, destroyed plumbing fixtures and water tank seepage. Proper operation and maintenance are not usually done.

DECS is currently promoting the practice of having one toilet within the classroom. This practice should be thoroughly reviewed with respect to maintaining sanitary condition, provision of water faucet/supply in every toilet/unit, proper design of depository to avoid groundwater pollution, and provision of regular sludge collection and disposal.

There are 39 public toilets found in public markets, bus/jeepney terminals and parks/playgrounds in the province. All these public toilets are sanitary resulting to 100% service coverage. Table 4.2.3 shows the number and service coverage of public utilities.

Public toilets at markets, bus/jeepney terminals and parks/playgrounds, although culturally acceptable, are improperly used and maintained resulting to unsanitary conditions. In most cases, no specific arrangements are made for the operation and maintenance and for the collection of fees to cover such costs. Although considered as sanitary because of the structure, most of the facilities have unsanitary conditions due to inadequate/lack of water supply and destroyed appurtenances because of vandalism.

4.2.4 Sewerage Facilities

There are no existing sewerage facilities in the province. Most of the wastewater from the dwelling units with acceptable facilities finds its way to open drains and eventually to watercourses. These deficiencies are the major contributing factors to the poor condition of the water environment in some areas of the province.

Table 4.2.2 School Toilet Service Coverage by Municipality

Municipality		Number of School	Total No. of Student	Number of Toilets		Service Coverage			
				Sanitary	Unsanitary	Served	%	Unserved	%
Anahawan	Public	4	1,189	41		1,189	100		
	Private	1	501	5		200	40	301	60
	Total	5	1,690	46		1,389	82	301	18
Bontoc	Public	31	6,403	90		3,600	56	2,803	44
	Private								
	Total	31	6,403	90		3,600	56	2,803	44
Hinunangan	Public	30	4,720	115		4,600	97	120	3
	Private	1	515	5		200	39	315	61
	Total	31	5,235	120		4,800	92	435	8
Hinundayan	Public	12	2,310	45		1,800	78	510	22
	Private	1	409	3		120	29	289	71
	Total	13	2,719	48		1,920	71	799	29
Libagon	Public	9	2,625	58		2,320	88	305	12
	Private	1	434	4		160	37	274	63
	Total	10	3,059	62		2,480	81	579	19
Liloan	Public	22	4,333	126	8	4,333	100		
	Private	1	448	4	1	160	36	288	64
	Total	23	4,781	130	9	4,493	94	288	6
Limasawa	Public	6	1,271	30		1,200	94	71	6
	Private								
	Total	6	1,271	30		1,200	94	71	6
Maasin (Capital)	Public	65	13,071	234		9,360	72	3,711	28
	Private	2	2,286	32		1,280	56	1,006	44
	Total	67	15,357	266		10,640	69	4,717	31
Macrohon	Public	21	5,166	100	2	4,000	77	1,166	23
	Private	1	513	6		240	47	273	53
	Total	22	5,679	106	2	4,240	75	1,439	25
Malitbog	Public	20	3,389	82		3,280	97	109	3
	Private	1	450	6		240	53	210	47
	Total	21	3,839	88		3,520	92	319	8
Padre Burgos	Public	7	1,407	28		1,120	80	287	20
	Private	1	485	14		485	100		
	Total	8	1,892	42		1,605	85	287	15
Pintuyan	Public	9	1,668	81		1,668	100		
	Private								
	Total	9	1,668	81		1,668	100		
Saint Bernard	Public	24	4,641	176		4,641	100		
	Private	1	467	12		467	100		
	Total	25	5,108	188		5,108	100		
San Francisco	Public	12	2,393	54		2,160	90	233	10
	Private	1	469	8		320	68	149	32
	Total	13	2,862	62		2,480	87	382	13
San Juan (Cabalian)	Public	12	2,611	48		1,920	74	691	26
	Private								
	Total	12	2,611	48		1,920	74	691	26
San Ricardo	Public	10	2,260	69		2,260	100		
	Private								
	Total	10	2,260	69		2,260	100		
Silago	Public	12	2,102	127		2,102	100		
	Private								
	Total	12	2,102	127		2,102	100		
Sogod	Public	28	7,447	144		5,760	77	1,687	23
	Private	1	545	12		480	88	65	12
	Total	29	7,992	156		6,240	78	1,752	22
Tomas Oppus	Public	19	3,056	100		3,056	100		
	Private	1	415	5		200	48	215	52
	Total	20	3,471	105		3,256	94	215	6
Provincial Total	Public	353	72,062	1,748	10	60,369	84	11,693	16
	Private	14	7,937	116	1	4,552	57	3,385	43
	Total	367	79,999	1,864	11	64,921	81	15,078	19

Table 4.2.3 Public Toilet Facilities and Service Coverage in 1998

Municipality	Number of Sanitary Toilets			Number of Unsanitary Toilets			Total Number of PU Toilets	Served		Underserved	
	Public Markets	Bus/Jeepney Terminals	Parks/ Playground	Public Markets	Bus/Jeepney Terminals	Parks/ Playground		Number of Sanitary Toilets	%	Number of Unsanitary Toilets	%
Anahawan	1						1	1	100		
Bontoc	1						1	1	100		
Hinunangan	1	1					2	2	100		
Hinundayan	1		1				2	2	100		
Libagon	1		1				2	2	100		
Liloan	1	1	1				3	3	100		
Limasawa			2				2	2	100		
Maasin (Capital)	3	1	1				5	5	100		
Macrohon			1				1	1	100		
Malitbog	1		1				2	2	100		
Padre Burgos	1	1	1				3	3	100		
Pintuyan											
Saint Bernard	1	1	1				3	3	100		
San Francisco	1	1	1				3	3	100		
San Juan	1	1	1				3	3	100		
San Ricardo											
Silago		1	1				2	2	100		
Sogod	2	1					3	3	100		
Tomas Oppus	1						1	1	100		
Provincial Total	17	9	13				39	39	100		

Chapter 5

EXISTING SECTOR ARRANGEMENT AND INSTITUTIONAL CAPACITY

5 EXISTING SECTOR ARRANGEMENT AND INSTITUTIONAL CAPACITY

5.1 General

Much has happened in the sector since 1987 when the national master plan for the sector was initially prepared. Its development targets to be attained for the medium term was renewed in 1996 through the Updated Medium Term Development Plan. The water supply, sewerage and sanitation sector today is still in a transition stage. As a recent development, a national level comprehensive plan, "The Philippine National Development Plan: Directions to the 21st Century," was published in 1998 by the NEDA.

As for the institutional aspect, the Local Government Code (1991) has essentially re-defined the role, relationship and linkages of central, provincial, municipal and barangay institutions in the provision of social basic services, including water and sanitation. Before the issuance of the Code, the responsibilities for water supply and sanitation functions were lodged with various national agencies. The new direction mandates the Local Government Units (LGUs) to play a larger role in planning and implementing water supply and sanitation projects; however this has raised serious institutional capacity and resource reallocation issues.

Chapter Five provides an overview of existing sector policies and arrangements as a basis for formulating modifications and improvements. It identifies current capacity building issues that need to be addressed in the early stages of master plan implementation. More importantly, it assesses the impact of the present devolved delivery system at the local levels.

5.2 Sector Reforms

The GOP has set the future agenda for sector reform. These initiatives followed the completion of the Water Supply Sector Reform Study and the National Urban Sewerage and Sanitation Strategy Study. The GOP has endorsed the major recommendations of these studies through the following NEDA resolutions. Further, these resolutions are reflected in the above mentioned National Development Plan.

(1) NEDA Resolution No. 4 (series of 1994)

In the context of the LGC and related decentralization efforts, LGUs now play a lead role in basic service delivery. NEDA Resolution No.4 allows LGUs to implement all levels of water supply projects and redefines the roles of other sector agencies.

With the purpose of ensuring common interpretation of clause (g) of NEDA Board Resolution No. 4 (series of 1994), the Implementing Rules and Regulations or IRR was prepared by the DILG and was approved by the NEDA in 1998. It delineates the responsibilities of government agencies involved in the sector and defines the role of LGUs in the provision of water supply and sanitation services, including O&M of the facilities. The new direction mandates the LGUs to play a larger role with an emphasis on institutional strengthening which is needed to adequately perform their devolved functions.

(2) NEDA Resolution No. 5 (series of 1994)

This resolution reaffirms the provision of urban sewerage and sanitation services. It designates LGUs as primary implementors of the sanitation/sewerage programs, also mandates the establishment of a Central Project Support Office (CPSO) at LWUA to assist LGUs in the formulation, preparation and implementation of sewerage/sanitation projects.

(3) NEDA Resolution No. 6 (series of 1996)

Providing the national government assistance to LGUs in the implementation of devolved infrastructure activities/facilities under the LGC in support of national priority programs in order to ensure efficiency, effectivity and more focused implementation. It affirms DILG's responsibilities for overseeing and administrating the NG assistance to LGUs in the implementation of devolved infrastructure programs/projects, and institutional, capacity and capability building of the LGUs (refer to 5.2, Data Report for the full text of NEDA Resolution No.4, 5 and 6).

5.3 Sector Institutions

(1) Existing Institutional Arrangements

Although the LGC mandates major changes on sector structure and performance within LGUs, the sector is still in transition. The new sector role and respective responsibilities of the LGUs and national agencies are defined in the IRR.

At the national government level, there are three line agencies (DPWH, DILG and DOH) and two government-owned and controlled corporations (MWSS and LWUA) which are responsible for sector project implementation (refer to Figure 5.3.1). A regulatory board, the National Water Resource Board (NWRB), coordinates the overall policy framework for water resources development and management. In addition, there are other government agencies involved but these are mainly concerned with macro planning, natural resources allocation decisions and environmental protection and management.

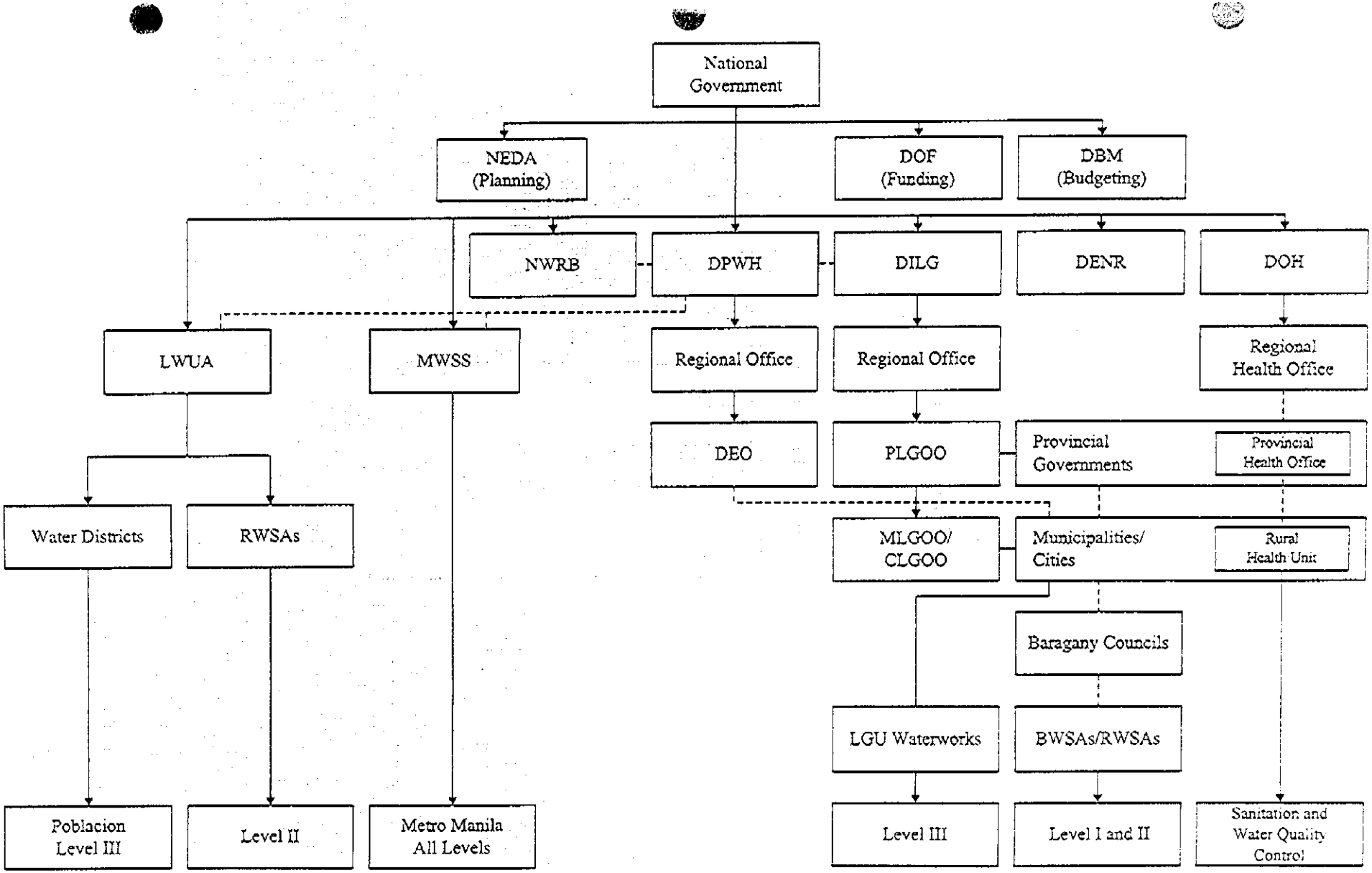


Figure 5.3.1 Functional Relationships

At the local level, field offices of national government agencies are present to guide and assist LGUs. The water districts and the BWSAs deal with the actual delivery of water in different service levels. Also, some LGUs operate provincial and municipal water supply systems by themselves. The private sector, non-government organizations and community-based organizations also undertake water supply and sanitation activities in the rural communities.

With the government decentralization and issuance of the NEDA Board Resolution No. 4, drastic changes took place among the DPWH, DILG, DOH and LGUs. The transition functions of these agencies are presented in Table 5.3.1. As shown, the function of implementing water supply projects (which DPWH used to undertake) has now been transferred to the LGUs. The functions of PHO under the DOH have likewise been devolved to the LGUs. The overall coordination function for the implementation of the WATSAN projects is now the responsibility of DILG.

Table 5.3.1 Transition Functions of the DPWH, DILG and DOH

Activity	Previous Involvement (Before NEDA Board Resolution No.4 in 1994)	Present Involvement (After NEDA Board Resolution No.4, s. of 1994)
Identify projects	DPWH	DILG
Design/Construct Level I	DPWH	LGU (PEO/MEO)
Repair/Rehabilitate Level I	DPWH	LGU (PEO/MEO)
Formulate/Evaluate maintenance. Program	DPWH	LGU (PEO/MEO)
Organize BWSA	DPWH	LGUs with DILG assistance
Train BWSAs on O&M	DPWH	LGUs with DILG assistance
Procure/supply materials/spare parts	DPWH	LGU (PEO/MEO)
Sector/Project monitoring and data-management	DPWH	LGUs with DILG assistance.
Overall coordination for project implementation (identification of project, training of BWSAs on O&M, and monitoring and data management). These functions were transferred from DPWH.	DILG	DILG
Assist LGUs to identify water supply systems, Level I, II and III. This function was transferred from DPWH.	DILG	DILG
Develop and implement rural sanitation programs nationwide	DOH	LGU (PHO)
Implement the sanitation component of integrated water supply and sanitation projects	DOH	LGU (PHO)
Monitor, inspect and disinfect water supply systems	DOH	LGU (PHO)
Provide its health workers with training on water quality surveillance, hygiene education, and water purification treatment processes	DOH	LGU (PHO)
Conduct health education campaigns	DOH	LGU (PHO)
Produce information, education and communication (IEC) materials on water supply	DOH	LGU (PHO)

(2) Sector Finance

In financing WATSAN activities, LGUs have fund sources as follows:

LGUs may tap their Internal Revenue Allotments (IRAs) which come from the national government regularly, and/or locally generated revenues. These resources can also be used as leverage to borrow from government or private financing institutions.

In addition, grant funds from National Government are provided to LGU under its social infrastructure development. However, availing these funds are regulated with conditions, e.g., from zero to 50 percent of development costs will be subsidized but limited only to Level I systems for 5th and 6th class municipalities. No subsidy will be provided for Level II and III systems.

LGUs can access ODA loans for devolved activities. However, they must pass through the Municipal Development Fund (MDF) and/or a Government Financial Institution (GFI). The policy-making bodies of MDF and GFI determine the re-lending/on-lending terms passed on to the LGUs. The policy on accessing loans through the MDF is currently under review by the central government to make the terms and conditions more concessional towards the LGUs.

LGUs may either finance the sector projects directly or involve the participation of the private sector through concession-, management- or service-contracts. (Details on the sector finance are given in Chapter 6.)

5.4 Sector Agencies at the National Level

(1) Department of the Interior and Local Government (DILG)

The DILG is responsible, through the promulgation of rules and regulations and by means of technical assistance and training, for facilitating the implementation of the LGC. Accordingly, it is the lead national coordination agency responsible for the supervision and administration of water supply and sanitation projects implemented by LGUs. It is also mandated to strengthen local capacity for delivery of the services.

General administration and institution building support to LGUs entail the following: i) assistance in the formation and training of BWSAs, ii) coordination of master plan preparation, iii) provision of external funds, and iv) formulation and installation of sector management systems (including O&M) and BWSA management systems. The DILG also

provides assistance to LGUs in terms of technical support for evaluation of water sources and design of simple water systems (Level I and II).

The Water Supply and Sanitation-Program Management Office (WSS-PMO), a unit within DILG, is primarily responsible for water and sanitation activities in the department. The Provincial Planning and Development Office (PPDO) and the Municipal Planing and Development Office (MPDO) are the immediate links of the DILG at the LGU level. For the purpose of ensuring coordination in implementing projects where there are other agencies involved, DILG facilitates the formation of Task Forces with the PPDO and the MPDO still assuming overall responsibility. Through the PPDO and MPDO, barangays that need improvements in water supply and sanitation are identified. Water supply and sanitation associations are then formed.

Likewise, the DILG is now one of the leading institutions tasked to promote gender-responsive project management. Under the leadership of focal points, gender awareness training seminars have been conducted at the regional and provincial levels.

(2) Department of Public Works and Highways (DPWH)

The Department was responsible for the construction and major repair/rehabilitation of rural water supply systems (Level I) and for the planning and execution of sewerage projects in some cities and larger poblaciones in the country with participation of LGUs. DPWH's responsibility drastically changed with the implementation of NEDA Board Resolution No. 4. Based on the new mandate, the functions of DPWH are now limited to setting technical standards and assisting LGUs, upon agreement and in coordination with LGUs, in the conduct of surveys, preparation of plans, specifications, and programs of work, construction management, and technical researches in WATSAN project.

The DPWH maintains about 92 District Engineering Offices (DEOs) nationwide at the field level. The DEOs have a water engineer and drilling crews and equipment. With the diminishing role, most of the staff members have transferred to the private sector.

(3) Department of Health (DOH)

The DOH is the principal health policy-making and implementing agency. Its main function is to develop and implement sanitation programs nationwide. It also administers health education campaigns aimed at reducing morbidity due to waterborne and sanitation-related illnesses, specifically diarrhea, which is the second leading cause of morbidity in the past years.

Under the current sector arrangement, the DOH shall assume the following responsibilities: i) set and/or update standards on water quality testing, treatment and surveillance and sanitary practices; ii) assist LGUs in the conduct of periodic water quality control and surveillance-related activities; iii) and monitor and evaluate health and hygiene education.

Through the Provincial Health Offices and Rural Health Units, the DOH conducts health and hygiene education campaigns that focus on women and children health improvement in rural communities. The DOH has produced and distributed the Information, Education and Communication (IEC) materials on water supply and hygiene behavior nationwide. Through its field health workers, it gives orientation to BWSAs on protection and disinfection of water sources and construction and maintenance of toilets.

(4) Local Water Utilities Administration (LWUA)

Presidential Decree 198 created the LWUA to act as a specialized lending institution for local Water Districts (WDs) and oversee the development of these water utilities based on the twin concepts of financial viability and self-reliance. In 1987, its responsibilities were expanded to include assistance to Level II Rural Waterworks and Sanitation Associations (RWSAs). The provision of Level II and III services and of wastewater disposal systems in communities outside Metropolitan Manila is largely coordinated by the LWUA. However, NEDA Resolution No. 4 directed LWUA to focus on its development-banking role to finance only viable WDs.

Financial services include economic and financial analysis, tariff analysis and fund sourcing. Various types of loans are available to finance the following activities: i) construction of water systems; ii) reactivation of non-operating systems; iii) rehabilitation and expansion of facilities; and iv) training. Special loans finance watershed management projects: construction of administration buildings; purchase of service vehicles, communication and computer facilities; restoration of facilities damaged by calamities; and initial or emergency operational needs. Commodity loans support generation of additional service connections.

LWUA maintains and fields a pool of management advisors, trainers, engineers and other professionals to give WDs and RWSAs proper guidance in their operation and administration. In addition, the Central Sewerage and Sanitation Program Support Office (CPSO) was established at LWUA to coordinate the implementation of sewerage and sanitation projects at the national level and to assist LGUs and WDs plan and manage sewerage and sanitation at the local level.

(5) Other National Agencies

There are other national agencies that provide macro planning, funding support, and regulatory guidelines for the water supply and sanitation sector.

The National Economic and Development Authority (NEDA), the country's central planning office, ensures that all agencies' plans and programs are consistent with national priorities in the Medium-Term Public Investment Program and the Priority Sub-Sector Activity Layout. External grants and loan proposals are reviewed and approved at NEDA through the Investment Coordination Committee (ICC). Together with the DILG, NEDA coordinates the establishment of a system for national sector master planning and monitoring system.

The Department of Finance (DOF) is responsible for the generation and management of the financial resources of the government. It reviews and approves all public sector debt, and sets the fiscal deficit of major government corporations (as part of the public sector-borrowing program).

The Department of Budget and Management (DBM) plans the budget allocations for the government agencies, including capital and operating expenditures, equity infusion to public corporations, and grants and subsidies. The budget is sent annually to Congress for approval. DBM also ensures that budget releases conform to approved plans and programs.

The National Water Resources Board (NWRB) coordinates the overall policy framework for water resources development and management. NWRB was created by Presidential Decree No.424 in 1974 and is a high level ex-officio body responsible for coordinating and integrating all activities related to water resources development and management. As such, it formulate policies, evaluates and coordinates water resources programs, regulates and controls the utilization, exploration, development, conservation and projection of the country's water resources including the regulation of private and LGU-operated utilities

The Department of Environment and Natural Resources (DENR) formulates and enforces policies and guidelines for environmental protection and pollution control. It is responsible for watershed protection and water resources management. It also checks compliance of major projects with environmental guidelines. DENR works with all environmental management agencies and special regulatory bodies.

The Department of Education, Culture and Sports (DECS) implements hygiene education programs through schools using the Teacher-Child-Parent (TCP) approach. Health and sanitation messages are integrated in the curricula and special activities are designed to make the parents and other family members practice what they learn. A wide range of learning materials is available and prototypes of safe water sources and water sealed toilets are set up in schools. DECS identifies priority schools for the GOP school toilet project and supports DOH's integrated health information, education and communication campaign using the formal and non-formal educational system.

5.5 Sector Agencies at the Local Level

(1) Provincial Level

The Provincial Governor, as the chief executive of the provincial government, exercises such power and performs such duties and functions in pursuing general supervision and control over all programs, projects, services, and activities of the provincial government, including ensuring the delivery of basic services and the provision of adequate facilities.

The Sangguniang Panlalawigan, as a legislative body of the province, enacts ordinances, approves resolutions and appropriates funds for the general welfare of the province and its inhabitants. It approves ordinances which ensure the efficient and effective delivery of basic services and facilities, including the establishment and maintenance of a waterworks system or district waterworks for supplying water to inhabitants of component municipalities and cities.

The offices of provincial government involved in WATSAN activities, are the Provincial Planning and Development Office (PPDO), the Provincial Engineering Office (PEO), the Provincial Health Office (PHO), the Provincial Treasurer's Office (PTO), the Provincial General Services Office (PGSO), the Provincial Budget Office (PBO), the Provincial Social Welfare and Development Office (PSWDO), and the Provincial Accountant's Office (PAO).

1) Provincial Planning and Development Office (PPDO)

The PPDO is in charge of the formulation of integrated and sectoral development plans and policies for the consideration of the Provincial Development Council (PDC) which is headed by the Governor. It conducts continuing studies and research and training programs to evolve plans and programs for implementation and promotes people participation in its planning activities. It likewise integrates and coordinates

all sectoral plans and studies undertaken by different functional groups or agencies. It monitors and evaluates the implementation of development programs/projects and activities in the LGU concerned in accordance with the approved development plan. This office is composed of three (3) technical divisions and Administrative division (refer to the organization chart in Supporting Report, Figure 5.5.1).

- Administrative – The section's function is to provide efficient administration and timely and adequate support services. It has two staff members.
- Plans and Programs - The division is responsible for undertaking planning and programming of various sector development activities: agriculture, social, water source, investments, trade and industry, tourism, capital improvements and annual implementation. There two regular personnel.
- Research, Evaluation & Statistics – The division conducts field surveys and inspection of proposed projects; prepares statistical reports and other documents necessary for the evaluation, planning and programming of projects; and project implementation. It likewise supports the plans and programs division in the preparation of needed documents. It has two staff members.
- Special Projects – The division is primarily responsible for the plan formulation of special projects. It undertakes project proposals and project studies preparation, conducts ocular surveys and investigation, and prepares recommendations. It also coordinates community involvement in project execution and liaises with concerned national, regional and LGUs. It has two staff members.

2) Provincial Engineering Office (PEO)

The Office of the Provincial Engineer is responsible for planning, designing, programming, construction and maintenance of provincial infrastructure including roads, bridges, water systems, buildings and other infrastructure which are within the jurisdiction of the province. It is also the responsibility of the PEO to extend technical assistance and advice to the municipalities as well as barangays of the province in planning, construction and repairs of infrastructure. It maintains the quality control of all projects under the provincial government. The office has six (6) sections, Administrative, Planing & Programming and Survey, Quality Control, Construction, Maintenance and Motorpool. No waterworks division/section exists in the PEO now except a skeletal force under the special project category due to limited manpower. (refer to Organization Chart - Figure 5.5.2, Supporting Report). The responsibilities of the respective sections of the PEO are discussed below:

- Administrative: It provides the necessary administrative and clerical services to support activities of the office. It is manned with 16 staff.

- Planning & Programming and Survey - The section is responsible in formulating and integrating general plans, programs and projects of the provincial government. It conducts designing, planning and programming of provincial/national projects assigned to the office. . It has 7 staff.
- Construction -- Its function is to provide technical supervision and overall activities relating to construction of roads, bridges and drainage system along provincial roads. It also prepares estimates of construction cost and program construction operations including equipment requirements. It has one regular staff. Casuals are hired depending on the project needs.
- Maintenance – This section's function is to provide overall technical supervision of activities related to the maintenance of roads and bridges and drainage systems along provincial roads. It has 4 staff members, and casuals are also hired for road maintenance.
- Quality Control - The task is to undertake and direct the conduct of laboratory tests on the durability and practicability of locally available materials and evaluate/assess acceptability. It has 2 staff.
- Motorpool – This section is responsible for managing the utilization of and maintaining vehicles and heavy/light equipment for the construction and maintenance of road, bridges and other provincial infrastructure. Thirty (30) staff members man it.

3) Provincial Health Office (PHO)

The provision of health services to the people in the province is rather unique. The organizational set up and services accountability have been divided into: public health under the supervision of the Provincial Health Officer; and hospital services under the Chief of Hospitals. The PHO provides technical assistance to rural health units (RHUs) and to barangay health stations (BHSs). It also assists in the promotion and maintenance of public sanitation. The office conducts field health information campaigns and renders health intelligence services. There are 7 provincial government-run hospitals in the municipalities of Maasin, Sogod, Liloan, Pintuyan, Anahawan, Hinunangan and Padre Burgos.

4) Provincial Treasurer's Office (PTO), Provincial Budget Office (PBO), Provincial Accountant's Office (PAO), Provincial Social Welfare and Development Office (PW\SWDO) and Provincial General Services Office (PGSO)

The PTO is in-charge of the disbursement of all local government funds. It collects taxes, revenues, fees and other charges that are needed to support the general appro-

priation ordinance. The office maintains and updates the tax information system in coordination with the PASSO and exercises local supervision over all treasury offices of component municipalities. It also conducts periodic tax education information/collection campaigns and trains barangay treasurers and officials on the methods of collecting real property taxes and other fees and charges.

The PBO administers the fiscal budget of the provincial government. It is responsible for budget preparation, execution, control and accountability. The office reviews and consolidates the budget proposals of different offices. It coordinates budget concerns with the treasurer, the accountant, and the planning and development coordinator. It also provides prompt and efficient reviews of municipal budgets.

The PAO is tasked with the recording and review of financial transactions in accordance with government accounting principles, rules and regulations. It summarizes and prepares financial statements for submission to different offices to provide information on the financial condition and operation of the province. The office also reviews financial transactions in accordance with existing auditing rules and regulations and recommends measures to improve the utilization of government funds and properties. The quality control function has been relegated to this office to ensure that transactions involving quality control are met.

The PGSO provides effective direction and coordination of the various administrative and support services necessary for the operation of the office, including the keeping of government records and the proper and timely dissemination of printed communication and correspondence. It is responsible for the acquisition/procurement of supplies and materials as identified in the overall fiscal plan. It collates and disseminates information on prices and other costs of supplies and other items commonly used by the provincial government.

The PSWDO provides community organizing activities to BWSAs.

5) Provincial Development Council

Each local unit shall have a comprehensive multi-sectoral development plan to be initiated by its development council and approved by its Sanggunian. For this purpose, the development council at the provincial, municipal, city or barangay level, assist the corresponding Sanggunian in setting the direction of economic and social development and coordinating development efforts within its territorial jurisdiction.

(2) Municipal and Barangay Level

1) Municipality

The municipal LGU functions primarily as a general purpose government agency that delivers basic, regular, and direct services and provides effective governance of the inhabitants within its territorial jurisdiction. It has a similar organizational structure and legislative authority as that of the province. For WATSAN projects, the following offices are directly involved.

The Municipal Planning and Development Office (MPDO) is tasked to prepare municipal development plans to formulate an integrated economic, social and physical development pan for the consideration of the Municipal Development Council (MDC). It is also mandated to monitor and evaluate the implementation of different development programs and activities in the municipality. The regular activities of MPDO includes: preparation of the municipal comprehensive plans and other planning documents; assessment, monitoring and evaluation of different projects of the municipal government; and assistance in the integration and coordination of all sectoral plans.

The Municipal Engineering Office (MEO) is responsible for the administration, coordination, and the supervision of all construction, repair and maintenance of public works in the municipality. It initiates, reviews and recommends innovation in policies and objectives, plans, programs, techniques, procedures and practices in infrastructure development, including zoning policies in the municipality. It performs engineering surveys to gather data for designs, layout or construction of waterworks system sanitation facilities, and other infrastructure projects.

The Municipal Health Office (MHO) provides through Rural Health Units/Barangay Health Stations (RHUs/BHSs) health services to the barangay residents such as family-planning, emergency/relief services especially in far-flung barangays, and other activities that promote the general well-being and health needs of the residents. Midwives and other health workers schedule periodic visits to these health units/stations. It also undertakes water quality testing through its Rural Sanitary Inspector (RSI) who works together with the provincial Supervising Sanitary Inspector.

2) Barangay

The LGC has designated barangays as independent units of local government. The

Barangay Council (BC) acts as a legislative body of the barangay. The barangays receive their shares in the IRA from the National Government. Apart from this, the BCs can enact tax and revenue ordinances to raise funds for discharge of the responsibilities conferred upon them by law and for the promotion of the general welfare of the inhabitants. They may also solicit funds for the construction of barangay facilities and charge reasonable fees for the use thereof.

(3) Field Offices of Central Sector Agencies

1) DPWH District Engineer's Office

There is one (1) District Engineering Office (DEO) of DPWH in the province. The DEO is mandated to undertake and evaluate the planning, design and construction, and work supervision functions for all public works within the district. It coordinates with other departments, agencies, institutions and LGUs within the district in the implementation of infrastructure projects. Currently, the previous water supply section (a unit under Construction Division) is maintained by the DEO. The staff members of this section consist of a water supply engineer, a well driller, and a supervisor.

2) DILG Provincial/Municipal Local Government Operations Offices

The Provincial Director and the Municipal Local Government Operations Officer belong to DILG, and are tasked to provide general administration and institution-building support to LGUs and other government agencies to strengthen their capacity to deliver basic services.

3) NEDA Regional Office

Various public and private sector organizations coordinate with DILG to establish the system for regional sector master planning and the monitoring system. The NEDA Regional Office acts as a secretariat of the Regional Development Council and ensures that sector plans are consistent with regional and national priorities. The office requires project proposals/plans and programs to be approved and endorsed by the Provincial Development Council, whose task is to incorporate, consolidate, and prioritize municipal plans, programs and projects.

The NEDA Regional Office No. 8 has already prepared the Regional (Region VIII) Master Plan (1999-2004). The PPDO was involved in the preparation of the M/P, specifically that concerns the province. NEDA also referred to the Provincial Development Investment Plan (1999 -2004) that was the basis for their annual action plan.

(4) Community Institutions and Water Supply System Operation Bodies

1) Barangay Waterworks and Sanitation Associations/Rural Waterworks and Sanitation Associations (BWSAs/RWSAs)

RA 6716 requires the association formation to ensure the provision of adequate, potable, and accessible water supply to its members through the proper operation and maintenance of water supply facilities. Its aim is to improve the health and economic well-being of their members, by providing them with safe and potable water for domestic use at a reasonable charge. It is also responsible for setting up its own financial contributions through collection of monthly dues for the operation and maintenance of the system. The BWSA's organizational size depends on the number of facilities, and the need, culture and situation in a particular barangay. Its structure is quite simple as consisting of the board of directors, a bookkeeper, and caretaker/s.

2) Water Districts (WDs)

A Water District is a government corporation formed pursuant to Presidential Decree No.198 and organized for the purpose of serving the water supply requirements of the residents within its franchise area. Technical and financial assistance (loans) are provided by LWUA to WDs. LWUA also exercises regulatory functions vis-a-vis the districts. To be self-sufficient, a WD is operated in a business-like manner to generate enough revenue from its water services. The income is used to meet operational expenses, debt service, and reasonable reserves for future rehabilitation of facilities and contingencies. Presently, two (2) WDs are supplying water to the respective franchise areas in the province, through Level III systems.

3) LGU Waterworks

Some municipalities of the province established LGU waterworks within their organizations for delivering Level III water supply services in areas that are not covered by the Water Districts. These waterworks are presently undertaking the operation and maintenance of the respective Level III water supply systems by themselves. The fees are being collected from water users for recovering cost of operation and maintenance of facilities.

(5) Private sector and NGO

Many water and sanitation systems are implemented by the private sector, NGO, and community-based organizations (CBOs) which often times undertake the operation and maintenance of the systems. NGOs and the private sector for the past decade have been involved in water supply development through investments, technical studies and con-

struction of water supply and sanitation facilities. They have also demonstrated capability to undertake project implementation through community participation.

5.6 External Support Agencies Active in the Sector

(1) USAID

The Barangay Water Program (BWP) was a special project being implemented by the then Ministry of Local Government (now DILG) with financial assistance from the USAID. The program envisions improving the health status of small rural farming and fishing communities by providing safe, adequate and potable water through the establishment of public faucets or individual house connections. The systems for these communities should be owned, operated, maintained and managed by the users themselves through rural waterworks and sanitation associations. The program also intended to enhance the capabilities of local government units in project planning, programming, designing, implementation, evaluation and monitoring. Phase I of the BWP was implemented in the period 1978 – 1981; Phase II started in 1982 and was extended until December 1987. Phase II operations officially ended in December 1987, but a one-year winding-up period was agreed upon between the GOP and USAID. USAID extended loans to cover the construction costs and the installation of facilities on a reimbursement basis while the GOP through DILG shouldered the operational, training and personnel costs. Through BWP, waterworks projects were implemented in 50 provinces, 22 cities and 7 municipalities.

(2) World Bank

The World Bank supported the First Water Supply, Sewerage and Sanitation Sector Project or FW4SP. This project provided capital funds (US$58.0M) for rural water supply system in Luzon provinces and sanitation system nationwide based on completed provincial master plans. The project concept called for a community-based approach through BWSAs. The project was implemented from 1991 to 1995 with an extension up to 1997. Subsequently, the Capacity Enhancement Program (CEP) with DILG as implementing agency was conducted until the end of 1997. In addition, the Bank prepared a new loan for DILG implementation - the Local Government Urban Water Supply & Sanitation Project. This project will assist municipalities of the lower tier income class i.e. 4th, 5th, and 6th (approximately 50 municipalities in 20 provinces nationwide, which are not covered by Water Districts: to improve water supply and sanitation services. Through its various trust fund facilities, the bank has also arranged for various technical assistance grants and other support activities.

(3) ADB

The Asian Development Bank (ADB) supports the Rural Water Supply & Sanitation Sector Project (RW3SP) through sector lending approach for the 20 target provinces of the country. The project area covers about 3,000 rural communities with population ranging from 200 to 5,000 persons in provinces located in Luzon, Visayas and Mindanao. RW3SP will: i) provide capacity-building to LGUs to enhance the delivery of social services; ii) improve social infrastructure for basic needs such as water supply and sanitation; and iii) reduce poverty incidences. The project also includes; i) comprehensive institutional capacity-building; ii) community development program; iii) point source water supply systems; and iv) public and household latrine facilities. This will be implemented from 1995 – 2000.

Other external agencies' activities on WATSAN projects are shown in the Supporting Report. The terms and conditions, priority areas, programs and projects by donor are shown in Table 5.6.1, Supporting Report.

5.7 Project Management Arrangement, and Issues and Problems

With reference to project management of the province, current vision and policies and practices in the implementation of WATSAN projects were investigated. The findings are discussed in terms of technical, institutional, financial, and community development aspects. Problems/issues are also discussed by sub-component. Current conditions of the municipalities investigated are referred to. Furthermore, some of the discussion items covered the entire sector management field.

5.7.1 Technical Aspect

(1) Project Identification and Prioritization

1) Project conceptualization and series of procedures to select a project

Every year, the provincial government identifies and prioritizes projects based on perceived needs, the PPDO consolidates WATSAN data extracted from the Barangay and Municipal Development Plans and resolutions. The PPDO conducts fieldwork together with their counterparts at the MPDO in order to identify and support project needs. This is accomplished through series of meetings with barangay people/officials. They then conduct the required survey in the barangay where the project may be located.

Barangay Council/s (BC/s) regularly submit barangay resolutions regarding priority projects to the municipality, in addition to the Barangay Development Plan. These project proposal/s are incorporated in the Municipal Development Plan. The Municipal Development Council, through its sectoral committees reviews, gives recommendations for endorsement to the Sangguniang Bayan (SB) for the adoption and approval.

Before incorporating it into the Provincial Development Plan, the PDC through its sectoral committees endorses the municipal development plan for consideration and prioritization.

2) Criteria for selection of the project

Project selection criteria are based on the indicators prepared by the NEDA Regional Office. These were meant to identify the existence of problems constraining the achievement of certain development objectives and/or to determine the perception of development potentials. However, it is still the Barangay Development Plan prepared by the barangay council and ratified during a barangay assembly, which serves as the benchmark for the realization of the people's aspiration.

To further ensure the sustainability of the project, it is essential to involve the people, starting from demand identification during the basic survey stage. This is especially true for Level I water supply systems. A simplified coordination mechanism showing responsibilities/activities required among concerned parties is necessary. Periodic follow-up by LGUs at the barangays is also important to ensure logistic support and manpower requirements of the LGUs.

After submission of a project request by the barangay, a series of steps including identification, validation and prioritization has to be undertaken by the concerned LGUs. These steps result in considerable time consumed before funding is finalized. A systematic and coherent project identification and prioritization among concerned parties is required.

With reference to the implementation of the medium-term target plan, review and modification of selection/prioritization criteria are done by LGUs taking into consideration the said barangay profile. The LGUs, together with barangay officials, should prepare the requirements (including barangay profile) in an expeditious manner as part of their annual activities.

(2) Preparation of Feasibility Studies (F/S) and Detailed Design (D/D) of Facilities, and Contract Procedures

1) Water source development experience in survey, planning and design of facilities

The provincial government is able to conduct water source development for both spring and ground water sources. In the case of spring development, technical-related information is collected from the barangay. This involves the location of untapped springs and determining its discharge rate during the dry season. The preliminary topographic survey (elevation and distance) is then conducted to prepare the hydraulic profile of the transmission pipeline. For groundwater development, its technical feasibility is evaluated based on available technical data along with information from the barangay duly supported by field inspection of the existing wells.

2) Feasibility Study (F/S) of water supply systems

The F/S for developing water supply systems is usually done. In addition to the preliminary study on water source development, water production and water demand determined as required by the project. Tentative locations of communal faucets are identified in a Level II system. The hydraulic profile (pipe size, length) and size of the intake box/reservoir are determined using methods learned in the International Training Network (ITN)/DILG training seminar. The BWP design standard is also applied in this case. Finally, a cost estimate of the required facilities is made.

3) Detailed Design (D/D) of facilities and tendering

The D/D of WATSAN facilities is prepared by the PEO based on the F/S report. It must also be within the available budget. Design of Level II systems is made using existing manuals and references. Hydraulic calculation is limited to a single pipeline while the design of the spring box/reservoir is a standard design of the RWDC (Rural Waterworks Development Corporation). However, the PEO has no experience in planning and designing large waterworks facilities including pumping stations/water treatment plants.

Future water supply system/s will require water treatment facilities, particularly those using surface water sources. The PEO will need more knowledge/practice in hydraulic analysis, structural calculation, and water treatment technology. Measures to increase the capacity of LGU technical staff in the area of planning and designing have to be considered. This may also involve the utilization of consulting services.

(3) Procurement of Materials and Equipment, and Facility Construction and Rehabilitation

1) Procurement of materials and equipment

In the sector, bidding is done to purchase materials (pipes, fittings, etc.). Although the Pre-qualification, Bid and Awards Committee (PBAC) conducts the bidding, the technical capability to prepare bid documents and to evaluate bids is very minimal.

Because of the large workload required in implementing the Medium-Term Development Plan (which includes the preparation of the required tender documents), there must be a thorough evaluation of pre-qualification documents and contract procedure. Presently, with the limited volume of work/projects, the procurement procedure already requires a long process which, always results in delays in project implementation. The provincial government should examine the current procurement system so that it can handle/manage forthcoming projects more efficiently.

2) Construction, Supervision and Rehabilitation

Construction of WATSAN facilities is usually done by the LGUs, either by the municipal or the provincial office. The barangay council and the users mobilize labor. The PEO together with the MPDO and MEO manage project implementation by hiring skilled laborers. The PEO personnel supervised the construction work, and the technical personnel of the Project Monitoring Committee regularly monitor the projects. In the rehabilitation of Level I facilities, some projects employ skilled labor at the request of waterworks/beneficiaries.

In spite of the LGUs' efforts, it is apparent that their present implementation capability is limited to a certain number of projects due to insufficiency of manpower resources and the shortage of supporting vehicles/equipment. Contracting-out to the private sector may be practical. It is also necessary to increase the number of experienced water supply engineers to consider and supervise future projects.

(4) Operation and Maintenance (O&M) of Facilities

1) O&M of facilities by service level

For Level I facilities, the BWSAs or beneficiaries are responsible for O&M; however their performance has not been sufficient. This can be gleaned from the presence of numerous non-functioning/abandoned wells previously constructed by DPWH. This problem arises due to lack of spare parts, drying up of water source, and water quality problems, e.g., colored and salty water, etc. In some cases, the BWSA encountered problems related to the water source just a few months after turnover of the facility.

Thus, the beneficiaries revert to using their private dug wells.

O&M of Level I facilities is not properly done by BWSAs/beneficiaries due to lack of sense of ownership. Occasionally, the users contributed money to purchase spare parts when pump facilities broke down. Hence, it is necessary for the users to consider not only the repair/replacement of mechanical parts but also the re-development of wells and the future upgrading of the service level.

Level II and III systems, which are rather small in size are mostly managed by Barangay Councils/ communal associations. The required staff (permanent/casual) are designated to operate/maintain the facilities. There have been some cases, however, where expansion of distribution pipelines and additional service connections were undertaken without considering the technical aspects, e.g., capacities of water sources and distribution facilities. F/S and D/D should be prepared on a timely basis by the qualified engineer/s to avoid the decrease of supply pressure and quantity. Preventive maintenance of the system cannot be followed due to the shortage of major spare parts because of budgetary constraints.

2) Communication mechanism practiced in case of facility breakdown

It was observed that in cases where major repairs were required (non-functioning of hand pump parts, etc. for Level I), the BWSA or barangay council merely passed a resolution to the municipality/DEO - DPWH requesting for immediate repair. However, most BWSAs have inadequate knowledge of the channel of communication with LGUs or the private sector. The request for repair is therefore improperly addressed. A better communication system has to be prepared and put into service.

For major repairs of Level II and III (e.g. burst pipe/leakage), the municipal government permanent/casual staff restore/repair the system. When the budget is insufficient, the waterworks/RWSAs submit a funding request to the municipal or provincial government. Under the LGC, the LGUs are responsible for developing a system that will ensure sustainable O&M of water systems.

(3) Water Quality Examination

It is not rare to find fecal contamination at some water sources in all service levels. Water quality problems usually occur during floods. This is aggravated by poor sanitation conditions in most villages, e.g., inadequate toilets, improper construction of depositories/latrines, lack of sludge disposal management, and absence of drainage facilities.

The Rural Sanitary Inspectors (RSIs) of the RHUs or the municipal government collect the samples. Sampling and disinfection in communities are done only when they are needed. Collected water samples are analyzed at the provincial laboratory located in the provincial hospital in Massin. Those found positive for bacteria content are disinfected by the RSI. A regular program of disinfection for all levels of services should be followed and not done only when the source is found positive of bacteria contamination.

The analysis of the samples at the provincial laboratory depends upon the availability of chemical reagents, equipment, and manpower. It is also possible that improper handling of samples, particularly for samples from areas that are far from the laboratory, results in wrong findings. It is important that the laboratory be adequately supplied with equipment, chemicals and manpower, and that water sample be handled properly.

The water quality examination usually done in the province examines only bacteriological content and the physical characteristics of the water samples. Chemical parameters are not studied. The provincial laboratory should consider other water quality parameters (physical and chemical) which are necessary to determine the potability of water as indicated in the National Drinking Water Standards.

The PHO does not have enough budget for water quality control. The provincial government has yet to address this problem. Meanwhile, the incidence of water-borne/related diseases and the percentage of contaminated sources of drinking water remains alarmingly high. There is an obvious need for a budget for water quality surveillance.

(6) Private Sector Capability for the Sector Project

For the Level I water supply facilities, locally based private contractors have no capability in the construction of deepwells because they do not have the necessary drilling equipment. The LGU need to have a list of qualified contractors in large cities so that they can call them when needed. There are also few constructors that are capable in construction and rehabilitating Level II and small size Level III in the province. The same as for Level I, the LGUs need to have this list.

5.7.2 Institutional Aspect

(1) Implementing Capacity of LGUs

In spite of the LGUs' efforts, it is apparent that their present implementation capability is limited to a certain number of projects due to insufficiency of manpower resources, no

clear procedure and shortage of supporting vehicles/equipment. Contracting-out to the private sector may be practical. It is also necessary to increase the number of experienced water supply engineers and establish clear procedure and supervise future projects.

The implementing capacity of municipal government is also limited, though a larger water supply system is managed by WDs with a higher expertise. Sanitation projects are under direct responsibility of municipalities and barangays with coordination of the province. Commonly, qualified staff members are lacking and training for strengthening capacity building is not sufficient due to budgetary constraint. The assistance from existing WDs to the associations (Level I & II) may be one of the practical arrangements to ensure transfer of technical and management know-how.

(2) Linkages among Concerns

The PPDO is a lead provincial office responsible for the implementation of WATSAN projects. It works either directly or indirectly with the national government's local offices and municipalities as well as other provincial offices. There is, however, no established arrangement and responsibility delineation among the agencies involved in the WATSAN sector implementation in the province wherein interrelationship/linkages are clearly shown. Administrative and functional linkages are not spelled out, although in the area of PBME, the province is adopting the participatory monitoring and feed back mechanism developed through UNDP-assisted project (refer to 5.10.1 Project and Sector Monitoring). Subsequently, fragmental planning and implementation of sector projects happens, and a number of agencies and offices had overlapping activities and functions.

For tri-agency program such as DPWH, DILG and DOH implementing water supply projects, weak coordination had been demonstrated. There was difficulty in synchronizing activities which deals on physical construction of facilities (DPWH) as to activities that entails training of provincial/municipal water and sanitation task forces and formation of BWSAs where facilities will be constructed (DILG) and the installation of latrines and promotion of health and education programs (DOH). This assistance granted by NG agencies needs an integrated approach for an efficient WATSAN project implementation.

(3) Organizational Set-up

LGU is composed of province, municipality and barangay, and these units have respective responsibilities in implementing WATSAN project. However, to support the delivery of water and sanitation services, the operating structure at the province, municipality and barangay levels and identified organizational tasks should be put in place. This will

enable smooth implementation of the projects.

Before, organizing the association at the barangay level was undertaken by the PWDTF spearheaded by the DPWH. Since locally-funded water supply projects had been devolved to the LGUs, the DPWH no longer initiated the organization of BWSAs. In the existing organization set up of the province, the implementation of the Provincial Water Program is placed under the PPDO and PEO. However, it has been observed that the provincial staff (and also the municipal staff) responsible for planning, managing, coordinating, implementing and monitoring the WATSAN projects are unable to devote full time because they are to other works of various sectors.

(4) Operation bodies

In most cases, the operating bodies for the Level I facilities are not organized or non-functioning. A considerable number of public wells are abandoned/non-functional due to lack of O&M, dried-up of wells and other reasons. Most of the beneficiaries are not aware of the manner for O&M of the facilities. Beneficiaries still rely on LGUs even for a simple replacement of parts. Consequently, the barangay council often takes care of O&M. Considering the current situation of beneficiaries' involvement and experiences of abandoned/non-functional facilities, LGUs shall lead them to recognize the need of formation of association and participation for sound O&M of the facilities (information dissemination to beneficiaries is a requisite), and encourage the formation of association responsible for facility O&M.

The organization responsible for the O&M of Level II has some complexity comparing with that of Level I facility. Most of Level II systems (and small Level III) in the province are mostly managed by BCs. The merger or consolidation of these operation bodies can be explored for more effective and efficient system operation as well as system expansion and new development. This arrangement entails collaboration and agreement among concerned parties and the LGUs shall act as a coordinator and facilitator for the purpose.

The idea for Level II systems can also be adopted for an effective and efficient operation and development of Level III water supply systems.

(4) Health and Hygiene Education with Typical Program

There was a time when PWDTF was active and performed the job of IEC campaign in selected barangays in the province. The current practice is that the PHO undertakes

health and hygiene education as part of its regular programs. However, due to lack of financial support and manpower at the PHO, relevant activities are quite limited at the present time, unless it is a component of a DOH/UNICEF/NGO projects/program. It is recommended to put more attention to the needs of LGUs to ensure sustainable implementation for the development of the sector.

(5) Training programs

The central government agencies provide technical training for the LGUs' staff on a project basis. The DILG-PMO conducted recently the "Trainers Training and Community Organizing Training/Workshop" for the WATSAN sector where some of the topics discussed dealt on gender and development (GAD). Since LGUs have employed the cascade type assistance in implementing WATSAN projects, strengthening LGUs' staff capability in technical and institutional training for effective and efficient project implementation is important and periodic trainers training program would be necessary.

The provincial government provides technical assistance to the municipalities and barangays on a project basis or when the training is requested. The PPDO, PEO and other departments and national government agencies who are members of the Provincial WATSAN Team usually conduct the training, which are aimed at strengthening the capability of O&M personnel at the municipal and barangay levels. The 3- day training course is to be participated in by BWSA officials. It covers technical and management matters of a Level I facility before its turnover. Effective training program/s should be continued by the LGUs to ensure demand-responsiveness in community development.

(6) Database management

The main problem concerning data-base management are the inadequacy of the network coverage, outdated monitoring equipment, scattered data collection responsibilities, lack of continuous data records and lack of an integrated water resources database. Most data collection efforts are project related and are usually discontinued once the project is terminated. Good database will contribute toward the effective and efficient sector planning and project implementation. It is necessary to establish the database management system, at both national and local levels, which defines what, when, by whom the data/information shall to be collected and where, how, how long it shall be kept.