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 October 1998 and regarded as a figure in 1997). 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 1997.

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 49% of the present population (of which 30% in urban area and 70% in rural area) is considered as adequately served (refer to 4.1, Supporting Report for the detailed study). Under the area classification, 59% of urban population and 44% of rural population have access to safe water sources/facilities, while the rest is underserved or unserved. About 197,900 persons or 56% of the served population depend on Level I facilities, while about 154,900 persons or 44% are served by Level III and/or Level II systems. Lower service coverage in rural area seems to be the result of a considerable numbers of unsafe Level I facilities or no provision of facilities.

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 barangay level.

There are 26 Level III systems in the province operated under different kinds of ownership (authority or association) as shown in Table 4.1.2 together with their service coverage in 1997. These are:

- 5 Water Districts in the municipalities/cities of Carmen, Island Garden City of Samal, New Corella, Panabo and Tagum City;
- 2 Municipal waterworks in the municipalities of Asuncion and Kapalong;
- 18 RWSAa in the municipalities/cities of Asuncion, Carmen (2), Island Garden City of Samal (3), Kapalong (3), New Corella, Santo Tomas (3) and Tagum City (5);
- One privately owned system in Santo Tomas.

Tagum WD is the largest system in the province, covers 5 urban barangays and 6 rural barangays in the city of Tagum with served population of 80,100 (urban 40,050, rural 40,070) in provision of 7 deep well sources. Presently, only 44% of the urban population are served. The WD has practice scheduled water supply according to zone area due to insufficient water source and capacity of the facilities. Request for new connections/installation is suspended due to the same reason. In connection to the expansion plan, the WD conducted the investigation of potential water source outside Tagum in 1997. Panas Spring at Carcor, New Corella, 23 km away from the city is the most promising source with discharge of 30,000 m3/d.

Aside from the WD, Tagum has 6 other individual systems being operated by RWSAs. Population served of these waterworks ranges from 600 to 3,500 (details are referred to in Table 4.1.1, Supporting Report). They also utilize deep well sources.

Following Tagum WD is Tibal-og WW in Santo Tomas, the second largest system in the province. The RWSA supplies water to 13,300 persons in one urban barangay in provision of deep well source. In the municipality of Santo Tomas, there are other two systems covering one urban and one rural barangay with served population of 1,700 and 800 persons, respectively.

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
Asuncion	Asuncion WW	DW	120	100	1		1	200		200	1,200		1,200
	Magatos WW	DW	44	94		1	1		92	92		552	552
	Municipal Total	DW	164	98	1	1	2	200	92	292	1,200	552	1,752
Carmen	Carmen WD	DW/Oth	145	100	1		1	241		241	1,446		1,446
	Magsaysay WW	DW	33	100		1	1		84	84		504	504
	Minda WW	DW	106	100		1	1		176	176		1,056	1,056
	Municipal Total	DW/Oth	283	100	1	2	3	241	260	501	1,446	1,560	3,006
Island Garden	Samal WD	Surf	210	100	1		1	350		350	2,100		2,100
City of Samal	Kaputian Pob. (South) WW	SP	78	100	1		1	130		130	780		780
	Kaputian Pob. WW	SP	111	100	1		1	185		185	1,110		1,110
	Toril WW	SP	42	100		1	1		70	70		420	420
	Municipal Total	SP/Surf	441	100	3	1	4	665	70	735	3,990	420	4,410
Kapalong	Gabuyan WW	DW	41	100		1	1		68	68		408	408
	Kapalong LGU WW	DW	64	100	1		1	106		106	636		636
	Narra WW	DW	63	100		1	1		105	105		630	630
	Maniki RWW	DW	684	100	1		1	357		357	2,142		2,142
	Municipal Total	DW	851	100	2	2	4	463	173	636	2,778	1,038	3,816
New Corella	Limbaan WW	SP	101	100		1	1		168	168		1,008	1,008
	New Corella WD	SP	261	87	1	2	3	346	30	376	2,256	180	2,436
	Municipal Total	SP	362	91	1	3	4	346	198	544	2,256	1,188	3,444
Panabo	Panabo WD	DW/SW	700	100	4	4	8	765	398	1,163	4,590	2,388	6,978
Santo Tomas	Kimamon WWA	DW	84	93		1	1		130	130		780	780
	Marscon WW	DW	170	100	1		1	339		339	1,695		1,695
	Tibal-og WW	DW	1,469	91	1		1	2,223		2,223	13,338		13,338
	Municipal Total	DW	1,723	92	2	1	3	2,562	130	2,692	15,033	780	15,813
Tagum City	Tagum WD	DW	8,048	100	5	6	11	6,675	6,679	13,354	40,050	40,074	80,124
(Capital)	Visayan Vill. WW	DW	354	100	1		1	590		590	3,540		3,540
	Madaum WW	DW	136	100		1	1		226	226		1,356	1,356
	La Filipina WW	DW	217	100		2	2		441	441		2,646	2,646
	Makabayan WW	DW	265	100		1	1		224	224		1,344	1,344
	San Miguel WW	DW	205	85		1	1		304	304		1,824	1,824
	Floraville Home WW	DW	60	100		1	1		100	100		600	600
	Municipal Total	DW	16,088	100	6	12	18	7,265	7,974	15,239	43,590	47,844	91,434
Provincial Total			20,612	99	20	26	46	12,507	9,295	21,802	74,883	55,770	130,653

Note: 1. Type of Water Source: *DW* - Deep Well, *Surf.* - Surface Water (River), *SP* - Spring, *IG* - Infiltration Gallery.
2. * - Estimated at 100 lpcd.

In the municipality of Asuncion, there are two systems. Asuncion WW operated by municipal government one urban barangay. This waterworks was originally constructed as Level II system under BWP in 1983, however, the deep well source yielded no potable water. Other components of the project were already completed. A series of shallow wells were resorted to, but, there was no good result. After temporarily abandoned this project, the municipality managed to explore another potential sources. At present, the waterworks is partially catering needs of the poblacion (200 households). Another one is Magatos WW operated by RWSA.

The WW supplies to 90 households at one barangay in provision of deep well source.

In the municipality of Carmen, there are 3 systems. Carmen WD is catering water to one barangay in provision of deep well source. Served population is about 1,500 persons corresponding to only 17% of urban population. The water has saline taste. Majority of the people resorts to water peddlers selling water from Davao City. Other two systems are operated by RWSAs supplying water to two rural barangays with served population of 500 to 1,060, respectively. Water sources are also deep wells.

In Island Garden City of Samal, there are 4 waterworks in three administrative districts. The Samal WD which was transferred from LGU in 1997 is catering water one to urban barangay of Samal District with served population of 2,100. The WD is utilizing surface water as a water source, however, water quality is not meet to drinking purpose. WD is planning to utilize series of wells for future improvement for the facility.
In Kaputian District, one poblacion is served by two systems operated by RWSAs with served population of 1,900 totally. The system were originally designed and constructed as Level II, and converted to Level III. Water sources are springs, however, the water turn muddy during rainy days. In Babak District, one waterworks operated by RWSA supplies water to 70 households at one rural barangay in provision of spring source.

In the municipality of Kapalong, there are 4 waterworks operated by the municipal government and RWSAs. All of systems are utilizing deep wells as water sources. Makini RWW is the largest in the municipality. It covers one urban barangay with served population of 2,140. Other three are rather small size systems with population served ranging from 400 to 640.

In the municipality of New Corella, there are two systems utilizing spring sources. New Corella WD covers one urban and two rural barangays with served population of 2,400 t present. The system was originally designed and constructed as Level II using deep well source under BWP, however, no potable water was obtained. Then, existing spring source was tapped and RWSA transferred system to WD. Spring water is pumped up to increase the pressure of water from the source to storage tank which, was previously designed and constructed considering deep well source. Water supply does not meet the current demand due to insufficient capacity of facilities designed for Level II. The system needs upgrading and improvement. Another system operated by RWSA is catering water to one rural barangay with served population of 1,000.

In the municipality of Pababo, there is a WD supplying to 4 urban and 4 rural barangays. Water sources are combination of one deep well and series of 3 dug wells. Served population is about 7,000 (4,600 in urban and 2,400 in rural barangays). The WD covers only 10% of urban population and the remaining use Level I facility and/or water peddlers selling water from Davao City. Expansion of the system is required.

Another Level III at bagangay Manay is not functioning at present, since RWSA failed to manage waterworks.

Other municipalities such as B. E. Dujali and Talaingod have no Level III system/s at present.

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		
Carmen WD							5,160	
Samal WD								
New Corella WD	376	9	22		407	375	10,098	7,828
Panabo WD	1,163	17	213		1,393	1,393	73,321	69
Tagum WD	13,354		921		14,275	14,275	15,822	1,071

Note: No data available at Carmen and Samal WD

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, LWUA, DILG, LGUs) encouraging the use of spring sources and are operated by LGUs or RWSAs.

There are 28 Level II systems and majority of these is utilizing spring sources (19 systems) which concentrate mostly in Island Garden City of Samal. The city has the largest number, 17 systems or 60% of the total. Remaining 9 systems are using deep well as a water source (details are referred to in Table 4.1.2, Supporting Report).

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

(1) Management practice

Among the 24 waterworks that responded in the questionnaire regarding water fee payment, about 80% impose an average 10 Pesos/HH/month as flat rate, and the rest supplies water free of charge. This fact shows that current management practices will lead to

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
Asuncion	Santo Niño WW		2	2		100	100		600	600
	Sawata WW		1	1		100	100		600	600
	Municipal Total		3	3		200	200		1,200	1,200
New Corella	Mesa-oy RWSA		1	1		480	480		2,880	2,880
Island Garden City of Samal	Adecor WW		1	1		350	350		2,100	2,100
	Anonang WW		1	1		300	300		1,800	1,800
	Cogon WW		1	1		100	100		600	600
	Del Monte WW		1	1		111	111		666	666
	Guilon WW		1	1		100	100		600	600
	Kanaan WW		1	1		152	152		912	912
	Libertad WW		1	1		178	178		1,068	1,068
	Libuak WW		1	1		46	46		276	276
	Pangubatan WW		1	1		260	260		1,560	1,560
	San Antonio WW		1	1		190	190		353	353
	San Isidro WW		1	1		77	77		462	462
	San Remegio WW		1	1		182	182		1,092	1,092
	Sion WW		1	1		150	150			
	Sitio 16, Kaputian	1		1	126		126	756		756
	Tagbaobo WW		1	1		183	183		1,098	1,098
	Tagbay WW		1	1		90	90		540	540
	Tagbitan-ag WW		1	1		150	150		900	900
	Municipal Total	1	16	17	126	2,619	2,745	756	14,027	14,783
Kapalong	Monte Dujali WW		1	1		60	60		360	360
Panabo	Mabunao WS		1	1		110	110		660	660
	Sindaton WW		1	1		30	30		180	180
	Tibungol WW		1	1		90	90		540	540
	Municipal Total		3	3		230	230		1,380	1,380
Santo Tomas	Bobongon WW		1	1		272	272		1,632	1,632
	Balagunan WW		1	1		228	228		1,368	1,368
	Municipal Total		2	2		500	500		3,000	3,000
Talaingod	LGU		1	1		50	50		300	300
	Alson WW (Pvt)					60	60		360	360
	Municipal Total		1	1		110	110		660	660
Provincial Total		1	27	28	126	4,199	4,325	756	23,507	24,263

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, while cost recovery by the operating bodies is a prerequisite in sector management.

To attain financial and managerial sustainability, reinforcement of RWSA 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.

4.1.5 Level I Facilities

Level I facilities (point source) are common in rural barangays, majority of which are privately owned. Major facilities are different types of wells equipped with hand pumps or developed spring with transmission line and one communal faucet. Rain collector is also used in some areas.

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 in Supporting Report). Served population in 1997 is also estimated as shown in the same table.

Of the 42,185 operational Level I facilities, 20% are shallow wells. According to the PHO, 20% of shallow wells are estimated to be unsafe as the provincial average. All deep wells, covered/improved dug wells and developed springs are regarded as safe water sources. In application of the unsafe percentage to shallow wells for each municipality, 8,639 Level I facilities are classified as safe sources, while 33,546 facilities are under unsafe sources.

Percentage shares between public and private Level I facilities for rural water supplies are 4.6% and 95.4%, respectively. The share of developed springs in public facilities is 8%. (details are referred to Supporting Report).

Problem areas observed on Level I facilities and the necessary countermeasures for the improvement are summarized in terms of potable condition and functioning.

(1) Unsafe water sources

Most of the sources declared as unsafe are driven shallow wells which, are unprotected against seepage of surface water and 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.)

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
Asuncion	145	194	108	27	474	48	1,525		225	1,798	162	2,643	2,804	834	13,715	14,549
Braulio E. Dujali	6	114			120	29	1,903		674	2,606		146	146		691	691
Carmen	2	14	70		86	3	6,350		3,278	9,631		117	117		592	592
Island Garden City of Samal	104	98		24	226	25	9		5,933	5,967	360	336	696	1,827	1,724	3,550
Kapalong	505	315	24	15	859	79	247		33	359	925	6,447	7,372	4,780	31,785	36,565
New Corella		64	5	29	98	16	165		18	199		2,329	2,329		12,484	12,484
Panabo	460	3,743	39	20	4,262	936	1,576		6,117	8,629	2,800	6,293	9,092	14,166	32,533	46,699
Santo Tomas	82	1,832	9	3	1,926	458	500		866	1,824	1,101	6,199	7,300	5,769	31,677	37,446
Tagum City (Capital)	99	250	157	7	513	62	1,104		1,351	2,517	5,135	1,073	6,208	26,802	5,473	32,275
Talaingod	15	44	4	12	75	11	3		2	16		2,725	2,725		13,053	13,053
Provincial Total	1,418	6,668	416	137	8,639	1,667	13,382		18,497	33,546	10,481	28,308	38,790	54,177	143,727	197,905

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 a lot of non-functioning public wells in the province as shown in Table 4.1.6.

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.	620	830	798	7,505	9,753
	Percent	70.5%	80.6%	95.6%	99.5%	94.8%
Non-Functioning	No.	259	200	37	38	534
	Percent	29.5%	19.5%	4.6%	0.5%	5.2%
Total Number		879	1,030	835	7,543	10,287

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

For Level I facilities, the BWSAs or beneficiaries have responsibility on O&M, however, it is almost negligible. This can be gleaned from the presence of numerous non-functioning/abandoned wells constructed by DPWH. These conditions arise from lack of spare parts, drying up of water source and water quality problems such as colored water, etc. In some cases, they encountered problems relating to water source just a few months after turn-over of the facility. As a result of this, the beneficiaries resorted to using again their private dug wells that are considered unsafe.

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 1997, base year for planning purpose, was estimated referring to NSO's projection method. However, population distribution in 1995 census by urban and rural barangay prepared by 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 questionnaire survey results and the 1990 population census data; "Households by Main Source of Drinking Water and City/Municipality" considering some modification.
- The rest of the population was considered served by Level I facilities assuming that 50% of private facilities was shared by neighbors to supplement insufficiency of public facilities.

Average number of households sharing at each Level I public/private facility was calculated at an average of 23 households/facility under the above assumptions (details are referred to in Supporting Report).

Table 4.1.7 presents the profile of the service coverage in terms of served, underserved and unserved. As a provincial total, 49% of the population is adequately served (59% of urban population and 44% of rural population).

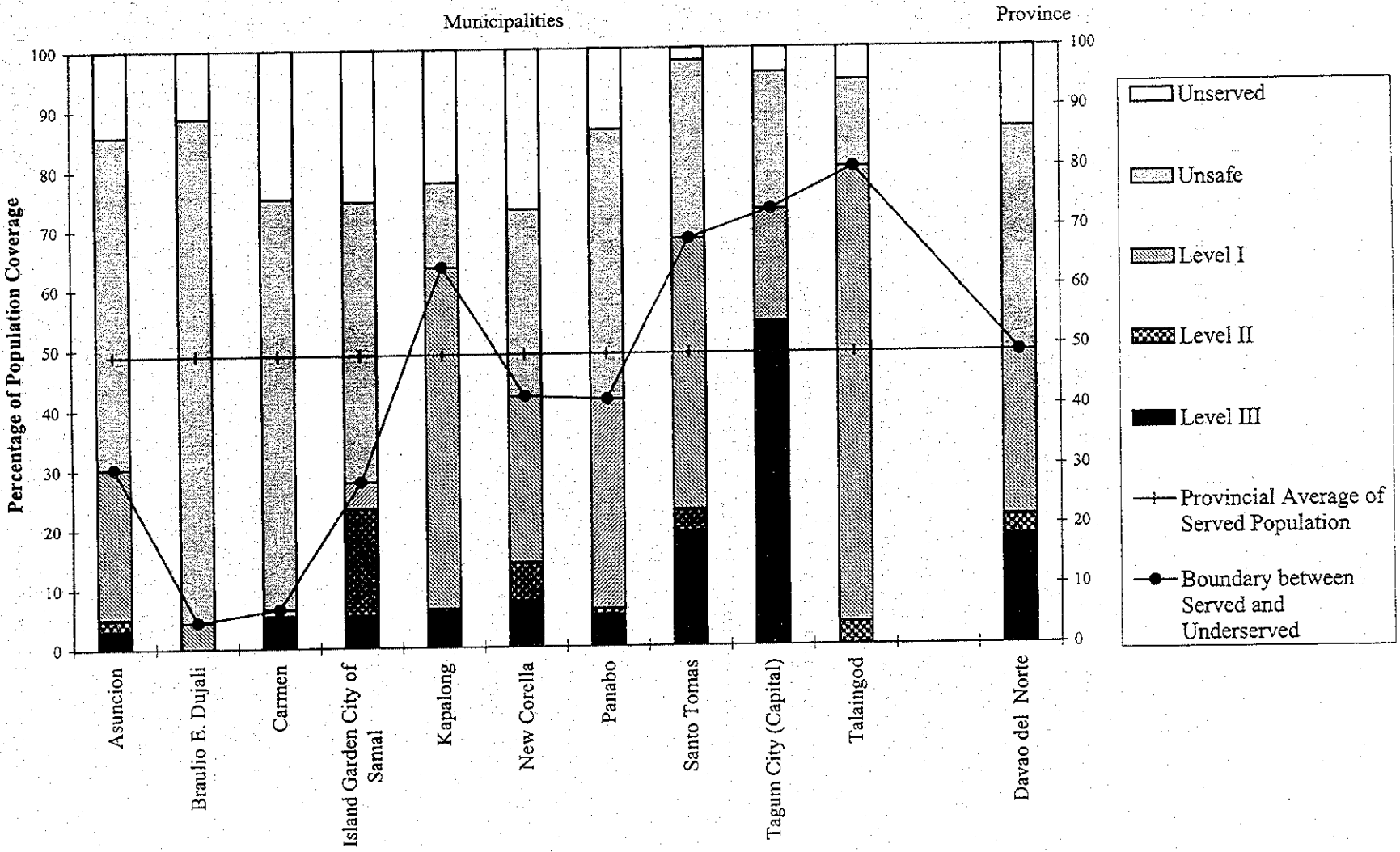
The percentage of underserved population is estimated at 38% of the total population (30% of urban population and 41% of rural population) who are depending on unsafe sources/facilities.

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

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
Asuncion	Urban	7,325	1,200		834	2,034	3,970	1,321	5,291	16		11	28	54	18	72
	Rural	50,556	552	1,200	13,715	15,467	28,159	6,930	35,089	1	2	27	31	56	14	69
	Total	57,881	1,752	1,200	14,549	17,501	32,129	8,251	40,380	3	2	25	30	56	14	70
Braulio E. Dujali	Urban															
	Rural	15,577			691	691	13,140	1,746	14,886			4	4	84	11	96
	Total	15,577			691	691	13,140	1,746	14,886			4	4	84	11	96
Carmen	Urban	8,716	1,446			1,446		7,270	7,270	17			17		83	83
	Rural	45,937	1,560		592	2,152	37,560	6,225	43,785	3		1	5	82	14	95
	Total	54,653	3,006		592	3,598	37,560	13,495	51,055	6		1	7	69	25	93
Island Garden City of Samal	Urban	16,733	3,990	756	1,827	6,573	6,858	3,302	10,160	24	5	11	39	41	20	61
	Rural	65,126	420	14,027	1,724	16,171	31,605	17,351	48,955	1	22	3	25	49	27	75
	Total	81,859	4,410	14,783	3,550	22,743	38,463	20,652	59,116	5	18	4	28	47	25	72
Kapalong	Urban	10,224	2,778		4,780	7,558	293	2,373	2,666	27		47	74	3	23	26
	Rural	53,930	1,038	360	31,785	33,183	8,957	11,790	20,747	2	1	59	62	17	22	38
	Total	64,154	3,816	360	36,565	40,741	9,249	14,163	23,413	6	1	57	64	14	22	36
New Corella	Urban	8,389	2,256			2,256		6,133	6,133	27			27		73	73
	Rural	36,514	1,188	2,880	12,484	16,552	14,099	5,863	19,962	3	8	34	45	39	16	55
	Total	44,903	3,444	2,880	12,484	18,808	14,099	11,996	26,095	8	6	28	42	31	27	58
Panabo	Urban	47,762	4,590		14,166	18,756	26,167	2,839	29,006	10		30	39	55	6	61
	Rural	85,598	2,388	1,380	32,533	36,301	34,165	15,132	49,297	3	2	38	42	40	18	58
	Total	133,360	6,978	1,380	46,699	55,057	60,332	17,971	78,303	5	1	35	41	45	13	59
Santo Tomas	Urban	29,421	15,033		5,769	20,802	8,336	283	8,619	51		20	71	28	1	29
	Rural	53,201	780	3,000	31,677	35,457	16,299	1,445	17,744	1	6	60	67	31	3	33
	Total	82,622	15,813	3,000	37,446	56,259	24,635	1,728	26,363	19	4	45	68	30	2	32
Tagum City (Capital)	Urban	91,030	43,590		26,802	70,392	19,480	1,158	20,638	48		29	77	21	1	23
	Rural	78,334	47,844		5,473	53,317	19,129	5,889	25,017	61		7	68	24	8	32
	Total	169,364	91,434		32,275	123,709	38,608	7,047	45,655	54		19	73	23	4	27
Talaingod	Urban															
	Rural	17,141		660	13,053	13,713	2,476	952	3,428		4	76	80	14	6	20
	Total	17,141		660	13,053	13,713	2,476	952	3,428		4	76	80	14	6	20
Provincial Total	Urban	219,600	74,883	756	54,177	129,816	65,104	24,679	89,784	34	0	25	59	30	11	41
	Rural	501,914	55,770	23,507	143,727	223,004	205,588	73,321	278,910	11	5	29	44	41	15	56
	Total	721,514	130,653	24,263	197,905	352,821	270,693	98,001	368,693	18	3	27	49	38	14	51

Figure 4.1.1 Water Supply Coverage of the Province



Among different service levels, Level I water supply facilities have a predominant service coverage over 6 municipalities out of 10 municipalities/cities in the province.

Percentage shares of population coverage by Level I public and private facilities in rural water supply are estimated at 31% and 69%, respectively (details are referred to in Supporting Report).

Level III systems take a major part of service coverage in urban water supply in limited municipalities, such as Santo Tomas (51%) and Tagum City (48%).

Level II systems do not take majority of service coverage in any municipality of the province. The current service coverage are only 3% as provincial average. As of now, piped systems (Levels II and III) have not been fully developed in the province.

Taking into account the municipal service coverage, of the 10 municipalities/cities of the province, 4 are above the average provincial service coverage of 49%. The highest coverage is seen in Talaingod at 80% followed by Tagum City (73%), Santo Tomas (68%) and Kapalong (57%).

In contrast to the above, 6 municipalities/city are below the provincial average. The lowest is Braulio E. Dujali at only 4%, followed by Carmen (7%), Island Garden City of Samal (28%), Asuncion (30%), Panabo (41%) and New Corella (42%). The low coverage in these municipalities/city is considered to arise from considerable number of existing unsafe Level I facility and difficulty in water source development due to lower availability of ground water sources.

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 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 and/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.

4.2.3 Sanitation Facilities and Service Coverage

(1) Household Toilets

The service coverage of sanitary toilets in the province is 73% of the total number of households. The rest is underserved or unserved. Of this, 43% are without toilet facilities (refer to Table 4.2.1, Supporting Report and 4.2.3 Sanitation Facilities and Service Coverage, Data Report).

Only 2 municipalities have higher service coverage than the provincial average of 73%. These are Tagum City (86%) and Asuncion (78%). On the other hand, the first 4 municipalities that registered the lowest service coverage are Talaingod (41%), B. E. Dujali and Island Garden City of Samal, both (65%) and Carmen (67%). It was observed that in municipalities that have high water supply service coverage (Tagum City, Kapalong), high sanitation coverage occurs and correspondingly, in low water supply service coverage (B. E. Dujali, Carmen), 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.

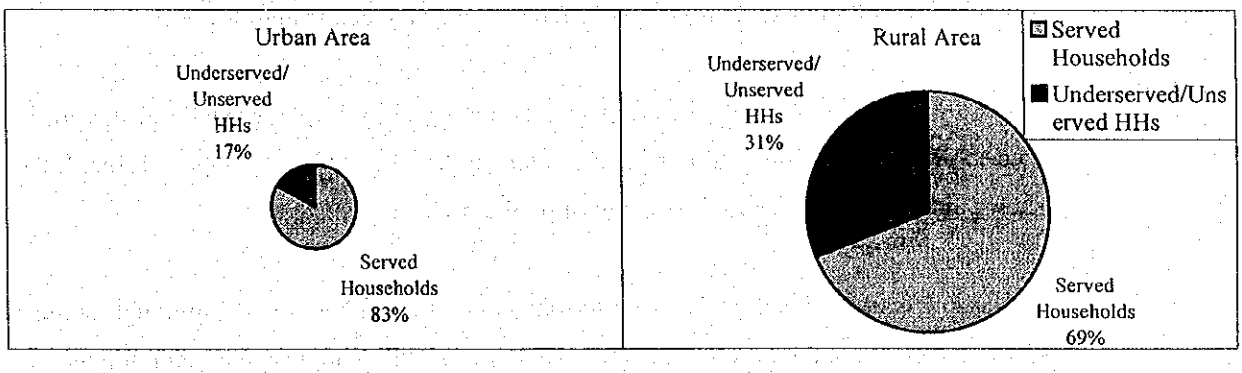
In urban areas, approximately 83% of the total households are served. A much lower served households of 69% exist in rural areas. Table 4.2.1 shows the municipal breakdown in the number of urban and rural household toilets by category, and service cover-

age. Figure 4.2.1 reflects the provincial service coverage of household toilet facilities for urban and rural areas.

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

Municipality City	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
Asuncion	1,420	9,741	11,161	1,299	91	121	9	7,390	76	2,351	24	8,689	78	2,472	22
Braulio E. Dujali		3,300	3,300					2,151	65	1,149	35	2,151	65	1,149	35
Carmen	1,692	9,061	10,753	990	59	702	41	6,216	69	2,845	31	7,206	67	3,547	33
Island Garden City of Samal	3,300	12,695	15,995	2,256	68	1,044	32	8,106	64	4,589	36	10,362	65	5,633	35
Kapalong	1,978	10,939	12,917	1,802	91	176	9	7,442	68	3,497	32	9,244	72	3,673	28
New Corella	1,574	6,812	8,386	1,224	78	350	22	4,456	65	2,356	35	5,680	68	2,706	32
Panabo	9,439	16,557	25,996	7,011	74	2,428	26	11,820	71	4,737	29	18,831	72	7,165	28
Santo Tomas	5,615	10,411	16,026	4,340	77	1,275	23	6,952	67	3,459	33	11,292	70	4,734	30
Tagum City (Capital)	17,439	15,360	32,799	16,456	94	983	6	11,789	77	3,571	23	28,245	86	4,554	14
Talaingod		3,578	3,578					1,454	41	2,124	59	1,454	41	2,124	59
Provincial Total	42,457	98,454	140,911	35,378	83	7,079	17	67,776	69	30,678	31	103,154	73	37,757	27

Figure 4.2.1 Provincial Service Coverage of Household Toilet Facilities, 1998



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 1,878 toilet units found in 363 schools. Sanitary toilets adequately serve only 43% of the students. The rest, 57% is underserved or unserved. Meanwhile, sanitary toilets adequately served about 41% of the public school students. Table 4.2.2 provides the service coverage of school toilet facilities.

The number of sanitary school toilets is quite low to meet the service level standard of 40 students per sanitary facility. At present, the average ratio is quite high 93 students per sanitary toilet, more than twice the standard level. A number of school toilets are not being used due to lack of water supply, destroyed plumbing fixtures and water tank seepage. In some areas, this problem is compounded when access to the sanitary facility is limited to only the teachers and guests.

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 35 public markets, bus/jeepney terminals and parks/playgrounds in the province. All of these public utilities have sanitary toilets, or 100% 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/City		Number of School	Total No. of Student	Number of Toilets		Service Coverage			
				Sanitary	Unsanitary	Served	%	Unserved	%
Asuncion	Public	36	14,682	233		9,320	63	5,362	37
	Private	1	217	7		217	100		
	Total	37	14,899	240		9,537	64	5,362	36
Braulio E. Dujali	Public	12	4,986	62		2,480	50	2,506	50
	Private	1	115	4		115	100		
	Total	13	5,101	66		2,595	51	2,506	49
Carmen	Public	23	11,313	166		6,640	59	4,673	41
	Private								
	Total	23	11,313	166		6,640	59	4,673	41
Island Garden City of Samal	Public	59	18,841	184		7,360	39	11,481	61
	Private	4	1,079	25		1,000	93	79	7
	Total	63	19,920	209		8,360	42	11,560	58
Kapalong	Public	43	15,447	168		6,720	44	8,727	56
	Private	5	849	26		849	100		
	Total	48	16,296	194		7,569	46	8,727	54
New Corella	Public	28	10,055	102		4,080	41	5,975	59
	Private	2	466	4		160	34	306	66
	Total	30	10,521	106		4,240	40	6,281	60
Panabo	Public	48	29,510	230		9,200	31	20,310	69
	Private	6	2,721	53		2,120	78	601	22
	Total	54	32,231	283		11,320	35	20,911	65
Santo Tomas	Public	30	18,835	123		4,920	26	13,915	74
	Private	7	1,314	28		1,120	85	194	15
	Total	37	20,149	151		6,040	30	14,109	70
Tagum City (Capital)	Public	37	37,874	371		14,840	39	23,034	61
	Private	13	4,290	73		2,920	68	1,370	32
	Total	50	42,164	444		17,760	42	24,404	58
Talaingod	Public	8	1,757	17	2	680	39	1,077	61
	Private								
	Total	8	1,757	17	2	680	39	1,077	61
Provincial Total	Public	324	163,300	1,656	2	66,240	41	97,060	59
	Private	39	11,051	220		8,501	77	2,550	23
	Total	363	174,351	1,876	2	74,741	43	99,610	57

Table 4.2.3 Public Toilets Facilities and Service Coverage in 1998

Municipality/ City	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	%
Asuncion	1	1	2				4	4	100		
Braulio E. Dujali											
Carmen	1	1	1				3	3	100		
Island Garden City of Samal	4	2	5				11	11	100		
Kapalong	1		1				2	2	100		
New Corella	1	1	1				3	3	100		
Panabo	2	1	1				4	4	100		
Santo Tomas	1		1				2	2	100		
Tagum City (Capital)	2	2	1				5	5	100		
Talaingod	1						1	1	100		
Provincial Total	14	8	13				35	35	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. These resolutions are also 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 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 (IRR) was prepared by the DILG and was approved by the NEDA in 1998. The IRR came out as NEDA Resolution No.5 (series of 1998). It delineates the responsibilities of government agencies involved in the sector and defines the role of local government units 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 (refer to 5.2, Data Report).

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

This resolution reaffirms the principle of provision of sewerage and sanitation services on the basis of willingness-to-pay. It 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 (refer to 5.2, Data Report).

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. There are government agencies involved but they are concerned with macro planning, natural resources allocation decisions and environmental protection and management.

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

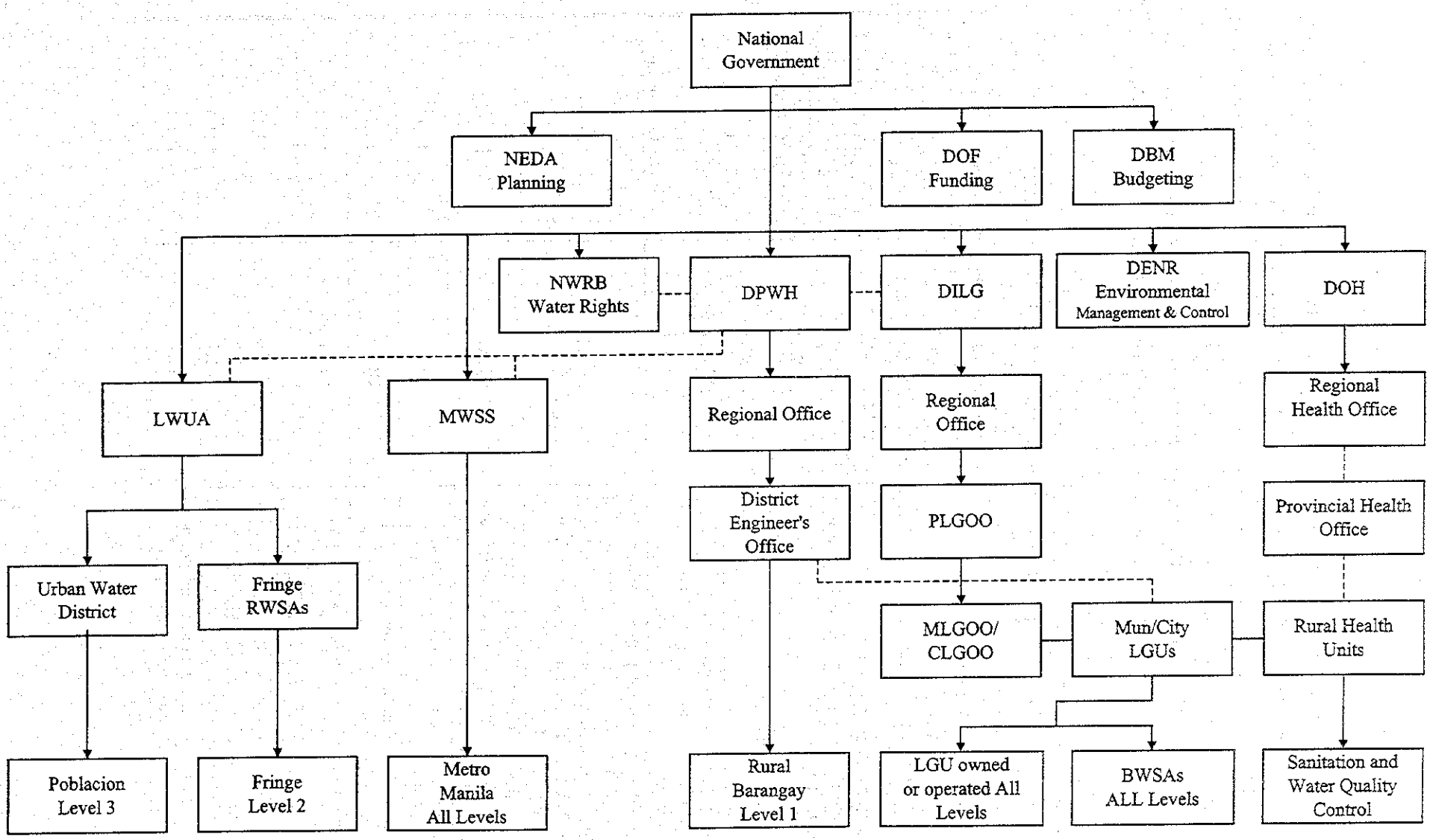


Figure 5.3.1 Functional Relationships

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(PPDO) with DILG assistance
Train BWSAs on O&M	DPWH	LGUs with DILG assistance
Procure/supply materials/spare parts	DPWH	LGU(PGSO/MGSO)
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	PHO
Implement the sanitation component of integrated water supply and sanitation projects	DOH	PHO
Monitor, inspect and disinfect water supply systems	DOH	PHO
Provide its health workers with training on water quality surveillance, hygiene education, and water purification treatment processes	DOH	PHO
Conduct health education campaigns	DOH	PHO
Produce information, education and communication (IEC) materials on water supply	DOH	PHO

(2) Sector Finance

1) Cost sharing arrangement

As a matter of policy, national government programs that have social and/or environmental objectives are implemented through a cost-sharing manner between the national government agency and LGUs. National government grants are provided for municipalities, which have limited socio-economic resources.

2) Financing and management systems

LGUs may either finance the sector projects directly or involve the participation of the private sector through concession-, management- or service-contracts.

In financing WATSAN activities, LGUs may tap their Internal Revenue Allotments (IRAs) and/or locally generated revenues for leverage. These are also the resources to borrow from government or private financing institutions.

LGUs can access ODA loans for devolved activities. However, they must pass through the Municipal Development Fund (MDF) 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.

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, iv) formulation and installation of sector management systems (including O&M) and BWSA financial 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-Project 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 which need improved water supply and households which need sanitation improvements 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) 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, LWUA 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.

(3) 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 projects.

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

(4) 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 PHO, the DOH conducts health and hygiene education campaigns that focus on women and children health improvement in rural communities. Centrally- produced information, education and communication (IEC) materials support the program. The DOH has produced and distributed 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.

(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. 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 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.

The National Water Resources Board (NWRB) coordinates the overall policy framework for water resources development and management. NWRB was created to guide the orderly and scientific development of all water resources in the Philippines. Its guiding principles are optimum utilization, conservation and protection of water resources to meet present and future needs. NWRB also deals with water rights issues; it regulates the use of water resources through the issuance of water rights and sets the tariffs of privately run water systems.

5.5 Sector Agencies at the Local Level

(1) Provincial Level

The offices involved in WATSAN activities are the Provincial Planning and Development Office (PPDO), the Provincial Engineering Office (PEO), the Provincial Health Office (PHO), the Provincial Treasury Office (PTO), the Provincial General Services Office (PGSO), the Provincial Budget Office (PBO), the Provincial Accountant's Office (PAO), and the Provincial Cooperative and Development Office (PCDO).

1) Provincial Planning and Development Office (PPDO)

The PPDO is in charge with the formulation of comprehensive development plans and policies for consideration of the Provincial Development Council. It conducts studies, research and training programs to support plan formulation and promotes people participation in its planning activities. It likewise integrates and coordinates sectoral plans and studies undertaken by different functional groups or agencies, and monitors and evaluates the implementation of development programs/projects and activities. The office is composed of three divisions, details of which are shown below (refer to Organization Chart Figure 5.5.1, Supporting Report).

- Plans and Programs Division - This division is responsible for planning and programming the various sector development activities: agriculture, social, water source, investments, trade and industry, tourism, capital improvements and annual implementation. At present, it has 6 regular personnel.
- Research and Statistics - It conducts continuing studies, researches and relevant training necessary to evolve plans and programs for implementation, and analyzes the provincial income and expenditure patterns and formulates and recommends fiscal plans and policies, and prepares and updates the Socio-Economic Profile of the province. It likewise coordinates with other line agencies in the implementation of other program/project. It has a total staffing complement of 4.

- Monitoring and Evaluation Division - The division is primarily responsible for monitoring and evaluating the implementation of the various development programs, projects and activities. It provides technical support and secretariat services to the PMC and the pre-qualification, Bids and Awards Committee (PBAC). There are 6 regular staff members.

2) Provincial Engineering Office (PEO)

The PEO is responsible for the administration, coordination, supervision, and control of construction, maintenance, improvement, and repair of roads, bridges, and other engineering and public works projects of the provincial government. It formulates policies and objectives, plans and programs, techniques and procedures and practices in infrastructure development and provides engineering services such as investigation and survey, designs, feasibility studies, and project management. It also provides technical supervision over all engineering offices of component municipalities. The office has five divisions as follows: (Refer to Organization Chart Figure 5.5.2, Supporting Report):

- Planning, Designing and Programming Division -- The division is responsible for formulating and integrating infrastructure plans, programs and projects of the provincial government, which involve construction works. It also conducts designing, planning and programming of provincial/national projects assigned to the PEO. Twenty-six (including proposed) staffs compose of the division.
- Construction and Maintenance Division – This division's function is to provide overall technical supervision of activities related to the construction and maintenance of roads, bridges, buildings and drainage systems in the province. It also prepares, estimates, and does construction work along road maintenance sections when such structures are deemed necessary. It has a total staff component of 68.
- Quality Control Division - The task of this division is to undertake and direct the conduct of field laboratory tests on the durability, soundness and practicability of materials in conformity to specification standards. This division also investigates, inspects and evaluates on-going and completed projects as to specification and requirements. Eight (8) staff members are working for the division.
- Equipment Pool Division – This division maintains heavy equipment including drilling rig, light equipment and other vehicles all in running conditions. The division also facilitates the dispatch of equipment to respective area of assignment/project. There are 84 staff in this division.

3) Provincial Health Office (PHO)

The PHO has two major functional units: a field health service unit and the hospital administration unit. The PHO formulates and implements policies, plans, programs and projects to promote the health of the people in the province. It also provides technical assistance to the RHUs and BHSs and assists in the promotion and maintenance of public sanitation. The office is also tasked with conducting health information campaigns and rendering health services. (refer to Organization Chart Figure 5.5.3, Supporting Report)

In consonance with its mission of bringing good health to the people and improving the delivery system, the province, through the PHO has proposed the setting up of a Rehabilitation and Delivery of Health Services Referral Center (RDRC) as base of the operations for a cluster of barangays. The plan is to initially cover barangays with no existing BHS, but as the proficiency of this project improves, the goal is to serve all localities.

The Center will coordinate nutrition activities, basic health service delivery, water and sanitation and other health programs of the PHO. Through this Center, the province plans to initiate the formation of the Barangay Sanitation Inspector to undertake an inventory of WATSAN facilities and to do water quality surveillance at the barangay level. This serves also as a focal point for first level referrals from the barangay (BHS) delivery of basic health services such as: Family Planning, Child Services Programs, Expanded Programs of Family Planning, Child Survival programs, Expanded Programs of Immunization, Nutrition and most of all as center for the barangay cluster for comprehensive surgical and dental outreach activities.

4) Provincial Cooperative Development Office (PCDO)

The PCDO is responsible for developing the cooperatives in Davao del Norte. It provides the following services: management and administration training, technical assistance for facility operation and administrative work, project development, coop accreditation with the province, and financial assistance. As for the activities in the WATSAN sector, a Memo Order has been issued giving the Provincial Cooperative Development Office jurisdiction over BWP-RWSAs. PCDO provides assistance in the formation of farm and non-farm cooperatives including the conversion of Level II and III associations into cooperatives. It is in-charge of the collection of loan payments from BWP-RWSAs. There are three cooperative waterworks systems in the

province: Two operate Level III system and one operates a Level II system.

5) Provincial Treasurer's Office (PTO), Provincial Budget Office (PBO), Provincial Account's Office (PAO), 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 appropriation ordinance. The office maintains and updates the tax information system of the province and supervises all treasury offices of component municipalities. It also conducts periodic tax education information/collection campaigns and trains barangay treasurers and officials in the methods of collecting real property taxes and other fees and charges.

The PBO provides fiscal budget administration for the provincial government. It is responsible for budget preparation, execution, control and accountability. The office reviews and consolidates the budget proposals of different offices of the LGU. It coordinates with the treasurer, the accountant, and the planning and development coordinator for the purpose of budgeting. 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 for their information, particularly 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 necessary to improve the system in the utilization of government funds and properties.

The PGSO provides effective direction and coordination over the various administrative and support services necessary for the operation of the office. This includes 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, shipping, and other costs of supplies and other items commonly used by the LGU.

6) Provincial Development Council (PDC)

The main function of the PDC is to formulate a long-term, medium-term, and annual

socio-economic development plan and corresponding policies, including the investment program of the province. The PDC is headed by the governor and is composed of the following: the representative of the congressman; the chairman of Sangguniang Panlalawigan's committee on appropriations; municipal mayors, representatives from NGOs; and the president of the association of barangay captains.

7) Provincial Project Monitoring Committee (PPMC)

The committee is tasked to monitor project implementation by all agencies (both local and national) in order to assess the progress of accomplishments, identify problems/issues encountered, and propose remedial measures or make recommendations where necessary. The PPMC reports project status to the governor and NEDA on a quarterly basis. The monitoring report is prepared by the PPDO, which is the secretariat of the PPMC.

(2) Municipal and Barangay Level

The municipal government coordinates the delivery of basic, regular and direct services to the inhabitants within its territorial jurisdiction. It has a similar organizational structure as that of the province. For WATSAN projects, the following offices are directly involved:

1) Municipal Planning and Development Office (MPDO)

The MPDO is in charge of planning and development and it formulates the integrated economic, social, physical, and development plan for consideration of the Municipal Development Council. Its regular activities include preparation of planning documents and monitoring and evaluation of projects.

2) Municipal Engineer's Office (MEO)

The MEO regularly performs engineering surveys to acquire data for designs and layout or constitution of waterworks systems, sanitation facilities and other infrastructure projects. It also inspects the work of contractors based on presented plans and specifications.

3) Barangay Councils (BCs)

The LGC designated barangays as independent units of local government. The barangay council acts as the legislative body of the barangay. The barangay councils are empowered to enact tax and revenue ordinances as may be necessary to discharge the responsibilities conferred upon them by law and to promote the general welfare of

its inhabitants. Such revenues are in addition to the barangay's share in the IRA from the national government. The BCs are also tasked to provide/solicit funds for the construction of barangay facilities, maintain and regulate their use, and charge reasonable fees for their use.

4) Rural Health Units/Barangay Health Stations (RHUs/BHSs)

The RHUs/BHSs are under the direct supervision of their respective municipalities since the MHO provides health services to the barangay residents. They provide assistance in family-planning activities, emergency/relief services especially in far-flung barangays, and other similar activities that promote the general well-being and health needs of the residents. Midwives and other health workers usually schedule periodic visits to these health units/stations.

(3) Field Offices of Central Sector Agencies

1) DPWH District Engineer's Office (DEO)

The DEO is mandated to undertake and evaluate the planning, design and construction, and work supervision functions of the DPWH 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, previous water supply section, a unit under Construction Division, is maintained at some DEOs. The staff members consist of a water supply engineer, a well driller and its supervisor.

2) DILG Provincial /Municipal Local Government Operations Offices (PLGOO/ MLGOO)

The PLGOO/MLGOO is tasked to provide general administration and institution-building support to LGUs to strengthen local capacity for the delivery of basic services. Every province has an assigned PLGOO.

3) NEDA Regional Office and Regional Development Council

Various public and private organizations coordinate with the DILG to establish the system for regional sector master planning and the corresponding monitoring system. The NEDA Regional Office is the Secretariat of the Regional Development Council and it ensures that sector plans are consistent with regional and national priorities. It requires that all project proposals/plans and programs be approved and endorsed by the Provincial Development Council (PDC) which incorporates, consolidates, and prioritizes municipal plans, programs and projects.

(4) Water Districts (WDs)

A water district is a local government corporation formed pursuant to Presidential Decree No.198. It is 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 water districts. To be self-sufficient, a WD is operated in a business-like manner so that it can generate enough revenue from its water sales. The income is used to pay for operational expenses and debt service and to build reasonable reserves for contingencies.

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

A BWSA is an organization of water supply and sanitation beneficiaries in a barangay whose objective is to own, operate and maintain the water systems. RA 6716 requires its formation to ensure the provision of adequate, potable and accessible water supply to its members through proper operation and maintenance of the Level I facilities. The organizational size of a BWSA depends on the number of facilities needed, and the culture and situation in a particular barangay. Its structure is quite simple as it consists of a board of directors, a bookkeeper, and a caretaker/s. The formation of the BWSA typically involves three phases: pre-formation/social preparation, formation, and post formation. During the formation phase, pre-membership training and election of BOD and Officers are held. In this phase, individual member's interests and community commitments are manifested through applications for membership and the signing of a Manifesto Resolution. RWSAs are organized to operate, manage and maintain Level-II and small Level-III systems, which are not covered by Water Districts.

(6) Private Sector

The local private sector has been involved in water supply development through investments, technical studies, and construction of water supply and sanitation facilities. NGOs have also demonstrated a capability to undertake project development and implementation with community participation.

5.6 External Support Agencies Active in the Sector

(1) Multilateral Agencies

The Barangay Water Program (BWP) was a special project implemented by the then Ministry of Local Government (now DILG) with financial assistance from the USAID.

The program envisions to improve the health standards 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, while Phase II started in 1982 and was extended until December 1987. Phase II operations ended in December 1987, but a one-year winding-up period was agreed 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 (including Bukidnon, Davao del Norte, Misamis Oriental and South Cotabato), 22 cities and 7 municipalities.

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. This 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.

The Asian Development Bank (ADB) currently provides assistance for the Rural Water Supply and Sanitation Sector Project or RW3SP. The project aims to improve the poor situation of water supply and sanitation of 20 Social Reform Agenda (SRA) priority provinces located in Luzon, Visayas, and Mindanao. The project consists of two parts -- institutional development and construction/rehabilitation of water supply and sanitation facilities. The total project cost is estimated at $57.4 million equivalent (foreign exchange component of $20.0 million and a local cost component of $37.4 million equivalent). Implementation period is from 1997 to 2001.

UNDP assisted the Institution Building for Decentralized Implementation of Community-Managed Water Supply and Sanitation Project or IBWSSP known as UNDP PHI/93/010 Project under the Fifth Country Program (1994-1997). This project directly responded to the government's Poverty Alleviation Program. UNDP provided assistance in strengthening the institution involved in the delivery of water supply and sanitation services with emphasis on support to local government units, NGOs, and communities through the BWSAs. The project complemented earlier efforts by UNDP (through the UNDP/ World Bank Water and Sanitation Program) to promote appropriate cost effective technologies in water and sanitation and to improve the training capacity of the sector. The project covered 7 provinces; 180 sub-projects were implemented in the objective areas during implementation period 1994-1997.

The United Nations Children's Fund (UNICEF) supports the sector through the Philippines Plan of Action for Children. Apart from hardware support in the priority project site, UNICEF assisted NEDA in updating the national master plan. UNICEF works through the inter-agency committee on environmental health and through NGOs. With the World Health Organization (WHO), UNICEF has been assisting in the preparation of Information, Education and Communication (IEC) materials and in strengthening the sector monitoring system. As part of these various assistance, UNICEF supported NEDA in 1997 for the assessment of WATSAN Sector of Southern Mindanao. This was compelled by the unexpected occurrence of water-borne epidemics that hit Region XI.

(2) Bilateral Agencies

The Japan International Cooperation Agency (JICA) has been extending a grant aid program for the Rural Environmental Sanitation Project which, is jointly implemented by DPWH and DOH. The project covered construction of Level I and II rural water systems and school toilet facilities in 10 provinces. With DPWH, rural water supply systems were constructed at the evacuation centers for the Pinatubo refugees. JICA also supported the groundwater development study in Cavite province (with LWUA) and the institutional development activities for MWSS. The PW4SPs for the 9 provinces in Luzon area were completed through previous technical cooperation.

The Overseas Economic Cooperation Fund (OECF) provided financial assistance for the RWS IV project. It provided a loan of up to Y 5.08B, with a counterpart fund of P 400M. The project covered construction/rehabilitation of Level I systems, construction of workshop building and procurement of different equipment. OECF has also been supporting

the Provincial Cites Water Supply Project of LWUA and the Angat Water Supply Optimization Project of MWSS.

DILG requested OECF last year to provide a loan for the Water Supply and Sanitation Project (WSSP) for the 6 provinces (based on JICA assisted PW4SPs). The project will achieve additional service coverage both for water supply and sanitation as follows: 549,100 persons with water supply, 9,579 households provided with latrines, 18,750 students with 375 school toilets and 72 public toilets.

The Australian International Development Assistance Bureau (AIDAB) supported the Central Visayas Water and Sanitation Project through a $ 14.65M grant. The LGUs and the RDC implemented the project. Project components include: planning and monitoring information systems; infrastructure planning and rehabilitation; and institution building with an emphasis on community management based on experience from other AIDAB-funded projects. The project period was extended until 1997.

The Canadian International Development Agency (CIDA) carried out until March 1998 Pre-Feasibility Study of Malalag Bay Alliance Water Supply Project. This project covers 10 coastal municipalities in Davao del Sur. The project includes water source development, construction of storage, transmission and distribution facilities, and service connections. Basic construction costs will be allocated between MBA and its municipalities. Implementation period is scheduled from 1998 to 2002. The Malalag Bay Area Development Office will submit a proposal for assistance to CIDA through the Regional Management Committee of NEDA Region XI office.

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

To assess the project management capability of the province, current 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 sector management field. (refer to the Table 5.7.1, Supporting Report)

5.7.1 Technical Aspect

(1) Project Identification and Prioritization

1) Project conceptualization and series of procedures to select project

Annually, the provincial government conducts project identification and prioritization based on perceived needs. The water supply project identification is done by the PEO/PPDO with PHO. The PEO conducts the required survey in the possible barangays where the projects may be introduced.

Among the selected barangays, some barangay councils submit barangay resolutions on the project/s to the municipality. The project proposal/s are incorporated in the municipal development plan. The Municipal Development Council (MDC), through its four sectoral committees, reviews and gives recommendations for endorsement. The MDC endorses it to the Sangguniang Bayan (SB) for adoption and approval which in turn endorses it to the Provincial Development Council (PDC) for appropriate action.

Before incorporating proposals into the provincial development plan, its sectoral committees though the PPDO review the municipal development plan for consideration and prioritization. After review, the PDC forwards the proposal to the Sangguniang Panlalawigan (SP) for adoption, approval, and allocation of appropriate funds. If the project is not included in the development plan, a supplemental program is prepared, especially projects for immediate implementation.

Before actual implementation starts, only the selected barangay/s are informed that the requested project/s were approved and funded.

2) Concerned parties/people in the sector and their respective activities

The PPDO/PHO play vital roles in the identification of project needs. Its activities include a series of meetings/assemblies and consultations with the barangay people, conducting barangay profile surveys, and identifying the needs for WATSAN facilities. The barangay people/officials become aware of the project needs and their roles by attending the meetings, assisting the surveys, and identifying the project/s. The barangay council prepares a resolution requesting the project and submits it to the municipality.

At the municipal level, the MDC through its 4 sectoral committees (i.e. Macro, Economic, Social and Infrastructure Committees) reviews and gives recommendations to the plan. This is then endorses it to the SB, and further to the PDC. The MDC is composed of the municipal mayor, one SB member, all barangay chairmen and representatives from accredited NGOs (which is 25% of the total membership). The SB member is the chairman of the committee on appropriations of the SB.

At the provincial level, likewise, the PDC sectoral committees (composed of line agencies, national agencies, accredited NGO and municipal mayors) endorse the provincial development plan (incorporating the municipal development plan of the different municipalities) to the PDC for consideration. The PDC deliberates upon the documents and if they are in order, endorses it to the SP for adoption, approval, and appropriate funding.

3) Priority criteria for selection of the projects

Selection criteria are based on the indicators prepared by the NEDA regional office. These indicators are meant to identify i) the existence of problems constraining the achievement of certain development objectives, and/or ii) the magnitude of certain development potentials.

4) Technical considerations applied for identification and prioritization

The barangay profile survey is conducted to derive technical considerations. The barangay profile contains technical matters such as water supply and toilet facility fabrication: brief description of water sources, etc.

To further promote sustainability of the project, it is essential to involve the people starting from demand identification and the basic survey stage. This is especially true for Level I water supply systems. Accordingly, a simplified mechanism showing responsibilities/activities required among concerned parties is necessary. A 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 procedures including identification, validation and prioritization is executed by the concerned LGUs. This process results in considerable time spent to finalize the funding. The LGUs must seek a simpler and more systematic procedure.

With reference to the implementation of the medium-term target plan, review and modification of selection/prioritization criteria shall be made by LGUs taking into account said barangay profile. The LGUs together with barangay people shall prepare the requirements (including the barangay profile) in a prompt manner as part of the annual activities.

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

1) Experience in master plan (M/P) preparation

The NEDA Regional Office is currently preparing the Regional Master Plan (1998-2008). The staff of the PPDO is presently involved in preparing the M/P, particularly the portion on the province. In addition, the Provincial Development Investment Plan (1994-1998) was prepared by the PPDO as a basis for their annual action plan.

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

Throughout the implementation of a WATSAN project, the provincial government conducts water source development for both spring and groundwater sources.

In the case of spring development, technical-related information is first collected from barangay people. This includes location of the untapped spring and its discharge rate during the dry season. The preliminary topographic survey (elevation and distance) is then conducted to prepare the hydraulic profile of transmission pipeline. For groundwater development, its technical feasibility is evaluated based on available technical data together with information from the barangay as supported by field confirmation at the existing wells.

3) F/S of level II and III systems

The F/S for the development of Level II and III systems is usually done by the PPDO/PEO. In addition to the preliminary study on the said water source development, water production and the water demand are determined to confirm with the project needs. Tentative locations of communal faucets are also identifies in a Level II system. Hydraulic profile (pipe size, length) and size of intake box / reservoirs are determined. The BWP design standard is applied in this case. Finally, a cost estimate is made for the required facilities. The F/S report is then submitted to the PPDC for evaluation and recommendations before approval.

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

The D/D of WATSAN facilities is also prepared by the PEO based on the survey and investigation. It must also be within the available budget. Designs of pipeline, structures and wells are based on the standard design prepared by BWP. The PEO has experience in planning and designing large waterworks facilities including pumping station and elevated storage tank.

The provincial office has also experience in contracting-out facility construction to local and national private sector. It has also experience in procuring materials from private sector. They have purchased materials such as pipes, cement, sand, reinforced bars and fittings for the projects conducted by the administration.

The province needs to enhance knowledge/practice not only in hydraulic analysis but also in structural calculation and water treatment technology. Measures to increase the capability of the LGUs' technical staff in planning and designing shall be sought. Alternatively, consulting services can be utilized.

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

1) Experiences in force account work for construction of facilities

In a situation where materials for WATSAN projects have to be procured, terms of reference are prepared by the PEO and bid documents are prepared by the PGSO. Materials are bidded through the Committee on Awards. After bidding is conducted, the PA issues a purchase order and the procurement is done by the PGSO. It usually takes at least 3 months after the approval of the procurement is made.

A huge work will be required for the implementation of medium-term development plan. This includes the preparation of the required tender documents, evaluation of pre-qualification documents, and the whole contracting procedure. At present, with the limited volume of the work/projects, the procurement procedure already requires a long process and this always affects project implementation. The provincial government should examine the current procurement system so that it could handle/manage the 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. In addition to the water supply facilities constructed

by the provincial government, the municipal governments also implement Level I projects. At the municipalities, the MPDO and MEO manage project implementation by hiring skilled labors, but usually the barangay council and the users mobilize unskilled laborers.

In spite of the LGUs' efforts, the present implementation capability is limited due to insufficiencies of manpower and financial resources as well as shortage of supporting vehicles/equipment. Contracting-out to the private sector may be practical. At the same time, it is necessary to increase the number of experienced water supply engineers who will coordinate and supervise future projects.

With regard to rehabilitation/major repair of the WATSAN facilities, the PEO in response to the request of the waterworks/beneficiaries usually provides the machines (i.e. drilling rig) and skilled manpower, and associations, barangays or municipalities provide materials and unskilled labor. In some instances, completion of the project is delayed due to budgetary constraints. It is necessary to establish a concrete implementation mechanism among concerned parties.

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

1) O&M of facilities by service level

For Level I facilities, the BWSAs or beneficiaries have responsibility for O&M. But, their performance has not been sufficient. This can be gleaned from the presence of numerous non-functioning / abandoned wells constructed by the government. This problem arose due to lack of spare parts, drying up of water source, and water quality problems such as colored water, salty water, etc. In some cases, the BWSAs encountered problems related to water source just a few months after the turnover of the facility. Thus, the beneficiaries revert to using their privately dug wells.

O&M of level I facilities is not properly done by BWSAs/beneficiaries because of a lack of sense of ownership. There was a case, however, where the users contributed money to purchase spare parts when pump facilities broke down. It is necessary for the users to consider not only repair/replacement of mechanical parts but also redevelopment of wells and future upgrading of the service level.

Level II and III systems which are small in size are managed by a RWSA /municipal government. The required staff (permanent/casual) are hired/designated to oper-

ate/maintain the facilities. There have been cases, however, where expansion of distribution pipelines and additional service connections were undertaken without due consideration of the technical aspects, i.e. capacities of water sources and distribution facilities. F/S and D/D should be prepared on a timely basis by qualified engineer/s to avoid the decrease of supply pressure and quantity. Preventive maintenance of the system can not be practiced due to the shortage of major spare parts stored/furnished, which is in turn due to budgetary constraints.

2) Communication mechanism practiced in case of facility breakdown

In cases where major repair was required (non-functioning of hand pump parts, etc. for Level I), the BWSA or barangay council passed a resolution to the municipality / DEO - DPWH requesting immediate repair. However, most BWSAs have no information on the proper organization/agency to refer to, so that their request for repair cannot be acted upon immediately. Communication system should be prepared and put into practice.

For major repairs of Level II and III (burst pipe/leakage), the permanent/casual staff undertakes the restoration/repair. In case the budget is not enough budget, the waterworks/RWSAs submit a funding request letter to the municipal/provincial government. In areas where RWSAs are not active, the barangay captain submits a request letter to the concerned agencies or directly to the provincial government. Under the LGC, the LGUs are responsible for developing sustainable O&M of their water systems.

(5) Water Quality Examination

1) The capability of the Provincial Laboratory for water analysis is limited to bacteriological content. Equipment for chemical and physical parameters is not yet available. Frequency of water sampling for both public and private wells are done as follows:

Level I once every 3 months
Level II once every 2 months
Level III once every month

It is Rural Sanitary Inspector of Municipal Health Office who collects water sample to insure accuracy of collection and specimen. Disinfection is done for positive samples by still the Rural Sanitary Inspector.

To determine the potability of water as indicated in the National Drinking Water Standards, routine examination should include Physical and Chemical parameters. In addition, water treatment should be done on regular basis for all sources, not to exclude negative water sources.

2) Capacity of laboratory

The PHO laboratory is open 24 hours a day since it is situated within the PHO Blood Bank. It is only capable of doing bacteriological analysis and could accommodate a maximum of 50 water samples a day from Monday to Friday. Five (5) regular and 3 casual medical technologists man it.

3) Water quality condition

In 1997, the PHO-Laboratory analyzed a total of 1,169 samples using multiple test tube method, the BGLB and E.coli. tests. Forty seven percent (47%) of the samples (548 out of 1,169) were found positive (indicating fecal contamination). This high percentage of water quality problem usually occurs during the rainy season, which could be attributed to poor sanitation condition in most villages. This also include factors like: inadequate toilet facilities, improper construction of depositories/ latrines, lack of sludge/sullage disposal management, and absence of drainage facilities.

4) Budgetary support

The PHO Water Laboratory is allotted an annual budget of P 100,000 for it operation. This amount covers the cost of laboratory supplies, culture media, equipment maintenance and other pertinent requisitions for its operation. In addition, this budget must cover water quality surveillance activities.

(6) Private Sector Capability for the Sector Project

There are enough capable local contractors who can perform WATSAN projects. Several experienced waterworks contractors were tapped during the implementation of the BWP projects. It is expected that the local contractors will be fully utilized in the forthcoming projects. It is necessary to prepare a database of available contractors and their skills relevant to WATSAN projects.