

2. PLANNING APPROACH FOR FUTURE SECTOR DEVELOPMENT  
2.6 Planning Principles and Data Management  
2.6.2 Data Management

(1) Computer-based System

The data management system was established to support the Provincial Sector Planning Team (PSPT) in the preparation of the Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP). An essential task of data management is to organize various kind of data into an effective and efficient information base.

A computer-based system was applied as a viable solution to process large amount of data and to minimize the human-error in calculation. For this particular project, a dynamic system is designed to allow the planner to adjust planning factors and update the information when further data becomes available.

It is viable and economical to choose the microcomputer with software suitable for the average skills of the common user. In this connection, of the two types of software package available, *database* and *spreadsheet*, the latter method was selected. Among the available spreadsheet-type software, EXCEL was used. EXCEL supports file conversion (opening and saving), multiple file opening, graphic presentation of data, What-You-See-Is-What-You-Get (WYSIWYG) formatting, scaleable font and view, etc. The following are the advantages and disadvantages of the spreadsheet method with reference to database method.

<u>Advantage</u>	<u>Disadvantage</u>
1. Minimum programming skills	1. Repeated entry of same formula
2. Friendly environment to users	2. Sorting or indexing is done manually
3. Graphic presentation of data at user's option	3. All data are loaded in memory, which require huge amount of memory
4. Execution of data linkage at formula level entry	4. Limited to static data linkages
5. Guided formula creation using function wizard	

Data management task starts from the collection of data using the questionnaire forms. The existence and accuracy of data are major concern at this stage to prepare main information bases. Using the microcomputer provided with EXCEL spreadsheet, data in the questionnaire forms are transferred into the forms constructed in EXCEL. Applicable policy, criteria and assumptions are entered into key parameter tables. These data are then processed and finally consolidated into target forms. These final forms provide a map of provincial profile, service coverage, future requirements, cost estimates for future sector development, and funding requirements.

Table 2.6.1 Key Parameter

No.	Description of Key Parameter		Unit	Values	
1.	Service Level	<b>Water Supply</b>			
		Number of household to be served by Level I Facility	HH/Source		
		Number of household to be served by Level II System	HH/Public Faucet		
		Water Consumption Rate for Level III System	Liter/capita/day		
		<b>Sanitation</b>			
		Std. number of student to be served by a unit of Sanitary toilet	Student/Toilet		
		Standard number of toilets for a public utility	Toilet/Public Facility		
2.	Provincial Sector Target	Medium Term Plan	<b>Water Supply</b>		
			Urban Water Supply	% of Population	
			Rural Water Supply	% of Population	
			<b>Sanitation</b>		
			Household Toilet		
			<b>Urban Household Toilet</b>	% of Household	
			Flush	% of Household	
			Pour Flush	% of Household	
			VIP Latrine	% of Household	
			<b>Rural Household Toilet</b>	% of Household	
			Flush	% of Household	
			Pour Flush	% of Household	
			VIP Latrine	% of Household	
			School Toilet	% of Public Student	
			Public Toilet	% of Public Utility	
		Solid Waste	% of Population		
		Long Term Plan	<b>Water Supply</b>		
			Urban Water Supply	% of Population	
			Rural Water Supply	% of Population	
			<b>Sanitation</b>		
			Household Toilet		
			<b>Urban Household Toilet</b>	% of Household	
			Flush	% of Household	
			Pour Flush	% of Household	
			VIP Latrine	% of Household	
			<b>Rural Household Toilet</b>	% of Household	
			Flush	% of Household	
Pour Flush	% of Household				
VIP Latrine	% of Household				
School Toilet	% of Public Student				
Public Toilet	% of Public Utility				
Urban Sewerage	% of Urban Population				
3.	<b>Percentage of Level I Deep Wells to be Rehabilitated</b>		%		
4.	<b>Percentage of Sector Management Cost to Construction Cost</b>				
	Feasibility and Detail Design		% of Construction Cost		
	Construction Supervision		% of Construction Cost		
5.	<b>Community Development and Training Cost</b>				
	Level III		% of Construction Cost		
	Level I, II and Public Toilet		% of Construction Cost		
6.	Recurrent Cost	Level III System (Operating Cost)		Pesos/HH/year	
		Level III System (Spare Parts/Equipment)		% of Construction Cost	
		Level II System (Spare Parts/Equipment)		Pesos/HH/year	
		Level I System (Spare Parts/Equipment)		Pesos/HH/year	
		Public School Toilet Maintenance Cost		Pesos/Toilet/year	
		Public Utility Toilet Maintenance Cost		Pesos/Toilet/year	
7.	<b>Allocation factors/Percentages of IRA</b>				
	From Provincial		%		
	From Municipality and Brgy.		%		
8.	<b>Funding Levels/Percentages for Different Financing Scenarios</b>				
	1st Scenario		% Funding Available		
	2nd Scenario		% Funding Available		
	3rd Scenario		% Funding Available		
	4th Scenario		% Funding Available		
	5th Scenario		% Funding Available		

Table 2.6.2 Composition of Well Sources and Specific Capacity

Name of Municipality	Type	Type Water Source	Proportion (%)	Standard Specification		
				Depth (m)	SWL (m)	Specific Capacity (liter/sec/m)
	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				
	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				
	Urban	Shallow Well				
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	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				
	Urban	Shallow Well				
		Deep Well				
		Spring				
	Rural	Shallow Well				
		Deep Well				
		Spring				

Table 2.6.3 Annual Investment

Sub-Sector	Component	1999	2000	2001	2002	2003	Total
Urban Water Supply	<b>Level III System</b>						
	Feasibility Study and Detail Design						
	Construction & Supervision Community Development & Training						
Rural Water Supply	<b>Level I Facility</b>						
	Detail Design						
	Construction & Supervision						
	Community Development & Training						
	<b>Level II System</b>						
	Detail Design Construction & Supervision Community Development & Training						
Sanitation	Urban Household Toilet						
	Rural Household Toilet						
	Public School Toilet						
	Public Toilet						
	Disinfection of Level I Wells						
	Detail Design Construction & Supervision Community Development & Training						

Table 2.6.4 Level I Safe & Unsafe Percentage

Name of Municipality	Safe (%)	Unsafe (%)
<b>Provincial Total</b>		

Table 2.6.5 Unit Construction Cost of Different Facilities

Description	Unit Construction Cost (Pesos)	Service Coverage		Unit Cost	
		Served Population	Served Household	Pesos/ Person	Pesos/ Household
<b>Water Supply</b>					
<b>Level III - New System</b>					
For 5000 Population					
For 10000 Population					
For 15000 Population					
<b>Level III - Expansion</b>					
For 5000 Population					
For 10000 Population					
For 15000 Population					
<b>Level II</b>					
<b>Level I</b>					
Deep Well - 40 meter depth					
Deep Well - 80 meter depth					
Deep Well - 120 meter depth					
Shallow Well - 18 meter depth					
Spring Development					
<b>Rehabilitation Cost for Level I Deep Well</b>					
<b>Disinfection of Level I Wells</b>					
<b>Sanitation</b>					
Flush					
Pour Flush					
VIP / Dry					
School Toilet					
Public Toilet					
Urban Sewerage					

Table 2.6.6 Scoring Factor for Municipal Investment Ranking for Urban Water Supply

Score	Underserved and Underserved Population in Base Year	Underserved and Underserved Population in Phase I	Population Underserved by Level III Systems in Base Year
1.0	< %	< %	< %
0.8	< % < 40	< % <	< % <
0.6	< % < 30	< % <	< % <
0.4	< % < 20	< % <	< % <
0.2	% < 10	% <	% <
Weight Allocation Score (%)			

Table 2.6.7 Scoring Factor for Municipal Comprehensive Investment Ranking

Score	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation
1.0	N.A.	< %	< %	< %
0.8	N.A.	< % <	< % <	< % <
0.6	N.A.	< % <	< % <	< % <
0.4	N.A.	< % <	< % <	< % <
0.2	N.A.	% <	% <	% <
Weight Allocation Score (%)				

### 3. PROVINCIAL PROFILE

#### 3.3 Socio-economic Conditions

##### 3.3.1 Economic Activities and Family Income

Table 3.3.1 Distribution of Families by Income Class

Income Class	Davao del Norte				Region XI	
	Total Families		Annual Income		Total Number of Families	Annual Income Average (Pesos)
	Number	Share	Total (P '000.00)	Average (Pesos)		
Under 20,000	19,326	11	341,354	34,154	101,022	37,457
20,000 - 29,999	38,249	21	1,116,793	29,198	146,000	31,053
30,000 - 39,999	33,350	18	1,471,734	44,129	158,442	41,890
40,000 - 59,999	46,411	25	2,680,660	57,760	196,591	57,594
60,000 - 99,999	35,383	19	2,947,144	83,293	173,880	89,775
100,000 - 249,999	9,791	5	1,421,781	145,213	97,315	162,959
250,000 and over	741	0	939,218	1,267,501	13,895	490,527

Source : 1994 Family Income and Expenditure Survey, NSO

Notes:

- (1) Excludes Surigao del Sur province (from previous classification)
- (2) Based on NEDA and other agencies , poverty threshold in Region XI in 1994 was estimated at P 41,579.07 (P 8,201 annual per capita poverty threshold).
- (3) For purposes of the survey, a family is defined as a group of persons usually living together and composed of the head and other persons related by blood, marriage and adoption. A single person living alone is considered as a separate family. A household is composed of 1 or more families in the same housing unit and have a common arrangement of food preparation and consumption.

Table 3.3.2 Employment by Major Industry Group and Class of Worker, 1994

Major Industry Group	Household Population 15 years and Over Who Worked	Class of Worker							
		Worked for Private Household (Domestic Services)	Worked for Private Business/ Enterprise/ Farm	Worked for Government/ Government Corporation	Self-employed Without Any Paid Employee	Employer In Own Farm or Business	Work With Pay in Own Family Operated Farm or Business	Work Without Pay in Own Family Operated Farm or Business	Not Reported
Agriculture, Hunting and Forestry	246,553	321	69,996	247	92,901	28,723	1,085	52,886	419
Fishing	7,154	9	1,467	6	4,701	272	16	667	16
Mining and Quarrying	10,855	46	8,091	8	2,364	154	21	137	35
Manufacturing	12,095	142	7,333	35	3,330	648	36	504	68
Electricity, Gas and Water	1,197	14	960	54	136	13	1	11	8
Construction	11,961	100	10,211	385	1,104	61	10	42	48
Trade	35,597	89	8,597	25	20,767	2,823	89	3,125	78
Services	87,653	20,099	30,863	20,265	13,183	1,727	88	1,218	219
Not Stated	954	22	242	14	79	14	1	53	529
<b>Provincial Total</b>	<b>414,019</b>	<b>20,842</b>	<b>137,760</b>	<b>21,039</b>	<b>138,565</b>	<b>34,435</b>	<b>1,347</b>	<b>58,643</b>	<b>1,420</b>

### 3.3.3 Education

**Table 3.3.3 Household Population by Highest Educational Attainment**

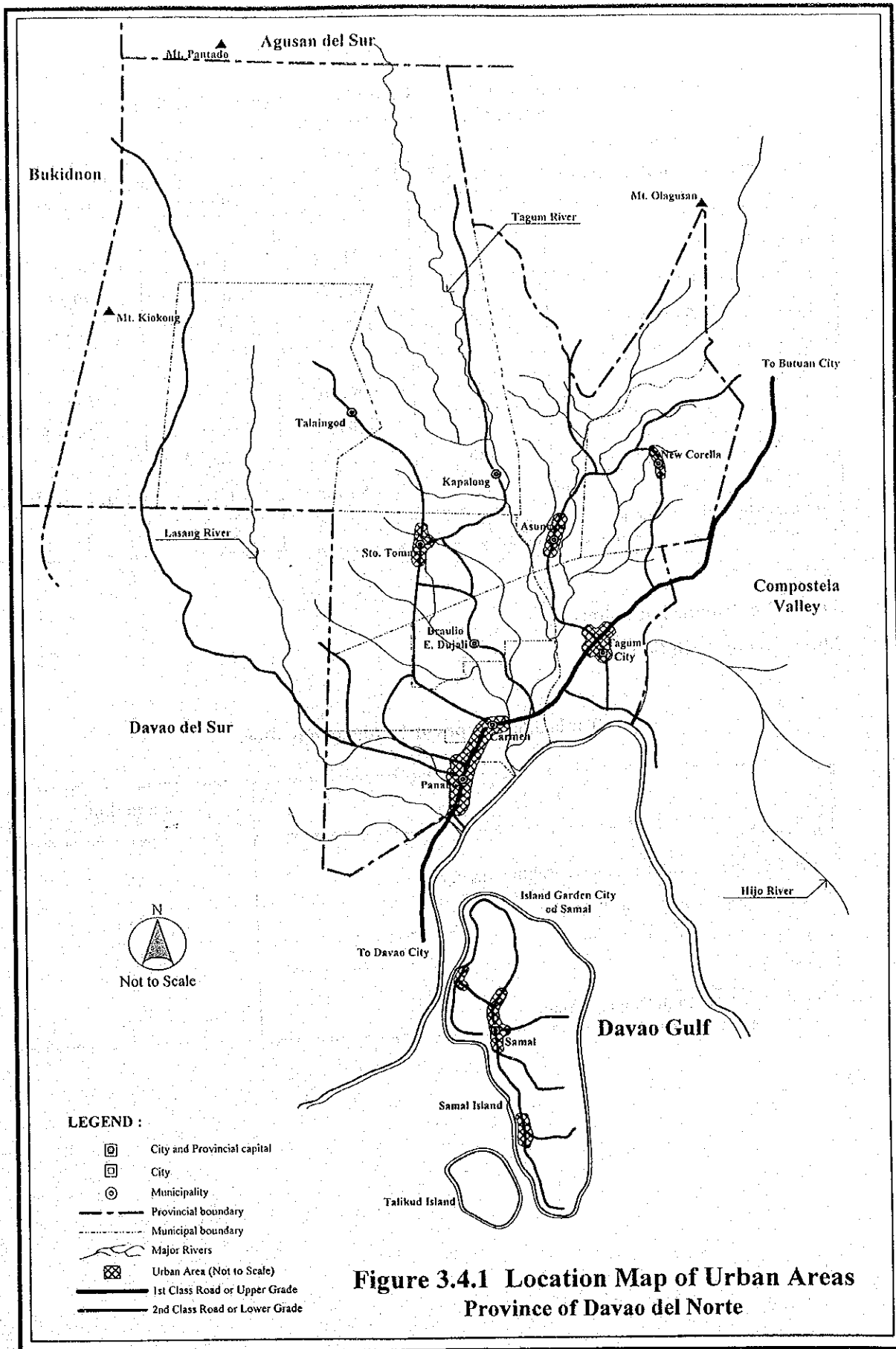
Highest Educational Attainment	Household Population 5 years Old and Over	Age Group				
		Below 20	20 - 24	25 - 29	30 - 34	35 and Over
No Grade Completed	81,344	57,778	2,164	2,172	2,001	17,229
Pre-school	35,759	34,876	68	86	64	665
Elementary						
1st - 4th Grade	262,308	162,605	11,305	10,571	10,204	67,623
5th - 7th Grade	245,002	78,156	23,471	25,309	23,275	94,791
High School						
Undergraduate	176,269	77,787	23,356	19,813	16,252	39,061
Graduate	101,174	16,745	20,680	18,221	14,913	30,615
Post Secondary						
Undergraduate	1,838	321	643	358	185	331
Graduate	7,166	492	2,234	1,541	1,015	1,884
College Undergraduate	55,360	11,028	13,585	8,703	7,075	14,969
Academic Degree Holder	41,207	231	6,560	8,493	7,660	18,263
Post-Baccalaureate	570	2	42	76	90	360
Not Stated	12,933	8,790	835	755	513	2,040
<b>Total</b>	<b>1,020,930</b>	<b>448,811</b>	<b>104,943</b>	<b>96,098</b>	<b>83,247</b>	<b>287,831</b>

Source: NSO



### 3.4 Population

#### 3.4.1 Classification of Urban and Rural Area



**Figure 3.4.1 Location Map of Urban Areas Province of Davao del Norte**

**Table 3.5.1 Number and Ratio of Population to Health Facilities and/or Medical Practitioners**

Health Facilities and Practitioners	Davao del Norte		Philippines	
	Number	Ratio	Number	Ratio
<b>Health Facilities</b>				
Hospitals/Clinics	30	1/24,050	1,700	1/40,206
Rural Health Units	12	1/60,126	2,335	1/29,272
Barangay Health Station	130	1/5,550	11,646	1/5,869
<b>Practitioners</b>				
Doctors	20	1/36,076	2,029	1/33,686
Nurses	25	1/28,861	2,694	1/25,371
Midwives	125	1/5,772	10,898	1/6,272
Dentists	9	1/80,168	1,071	1/63,818
Others Medical Practitioner	48	1/15,032		N/A

### 3.6 Environmental Pollution

#### 3.6.2 Water Pollution

**Table 3.6.1 Types of Drainage Facilities**

Type	Length (km)
Drainage Main	31
Open Channel (with Concrete & Rubble Masonry)	28
Open Ditches & Unlined Laterals	23
Reinforced Concrete Circular Pipes	6
Street Gutters	2
Outfalls to Rivers from Drainage Mains	

**Table 3.6.2 DENR Water Quality Criteria/Water Usage and Classification for Fresh Water**

Parameter	Unit	Class AA	Class A	Class B	Class C	Class D
Color	PCU	15	50	(C)	(C)	(C)
Temperature <sup>(D)</sup> (max. rise in deg. Celsius)	°C rise	--	3	3	3	3
pH (range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.0-9.0
Dissolve Oxygen <sup>(B)</sup> (Minimum)	%satn mg/L	70 5.0	70 5.0	70 5.0	60 5.0	40 3.0
5-Day 20°C BOD	mg/L	1	5	5	7(10)	10(15)
Total Suspended Solids	mg/L	25	50			
Total Dissolved Solids	mg/L	500	1,000	--	--	1,000
Surfactants (MBAS)	mg/L	nil	0.2(0.5)	0.3(0.5)	0.5	--
Oil/Grease (Petroleum Ether Extract)	mg/L	nil	1	1	2	5
Nitrate as Nitrogen	mg/L	1	10	NR	10	--
Phosphate as Phosphorous	mg/L	nil	0.1	0.2	0.4	--
Phenolic Substances as Phenols	mg/L	nil	0.002	0.005	0.02	--
Total Coliforms	MPN/100mL	50	1,000	1,000	5,000	--
or Fecal Coliforms	MPN/100mL	20	100	200	--	--
Chloride as Cl	mg/l	250	250	--	350	--
Copper		1	1	--	0.05	--

Notes:

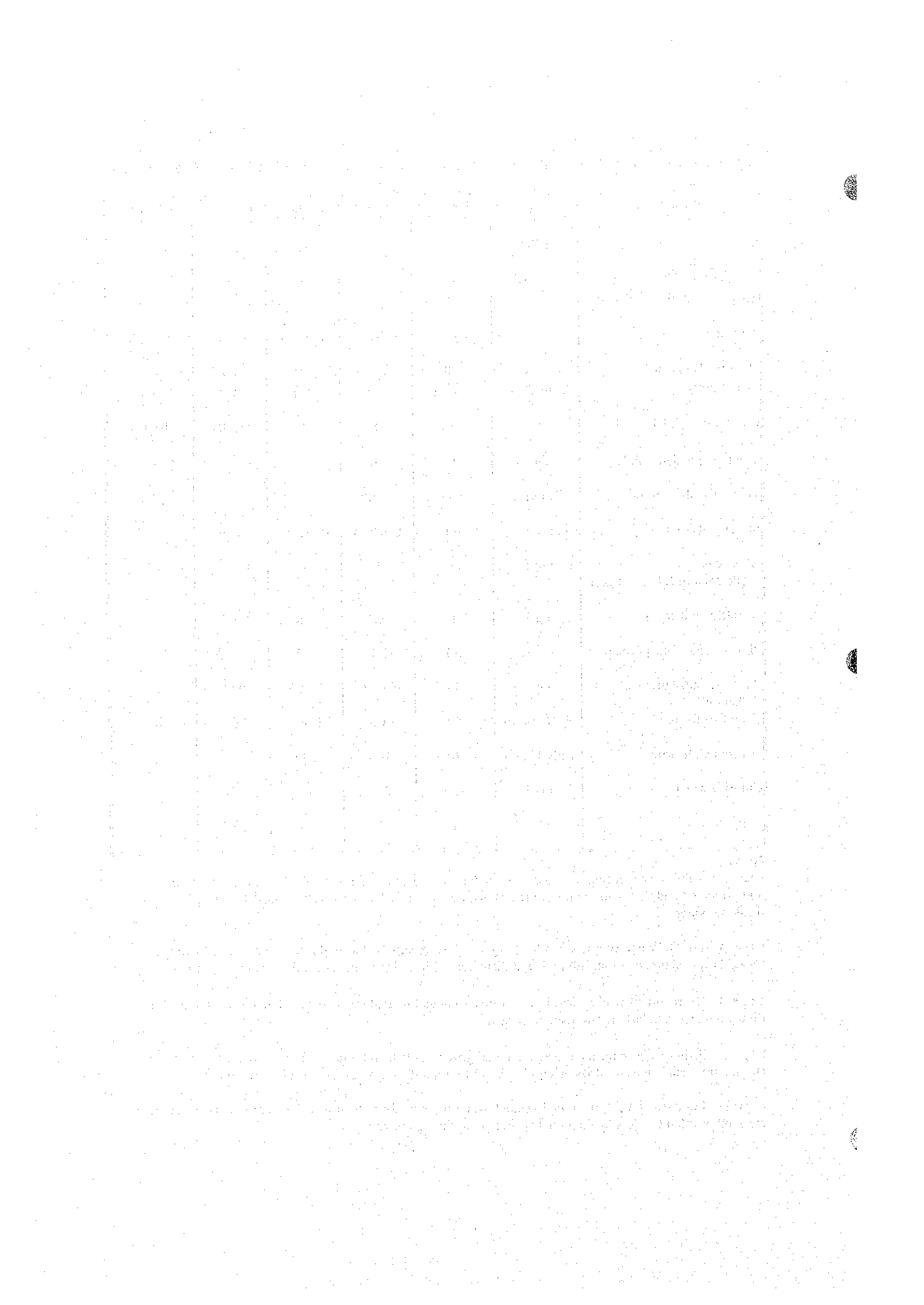
Class AA - Public Water Supply Class I. Intended for waters having watersheds, which are uninhabited and protected and that require only approved disinfection in order to meet the national standards for drinking water.

Class A - Public Water Supply Class II. Sources of water supply that will require complete treatment (coagulation, sedimentation, filtration and disinfection) in order to meet drinking water standards.

Class B - Recreational Water Class I. For primary contact recreation such as bathing, swimming, skin diving, etc. (particularly for tourism purposes).

Class C - Fishery Water for the propagation and growth of fish and other aquatic resources; recreational (for boating, etc.); industrial water supply class I for manufacturing processes after treatment.

Class D - For agriculture, irrigation, livestock watering, etc.; for industrial water supply class II (cooling, etc.); other inland waters by their quality, belong to this specification.



#### 4. EXISTING FACILITIES AND SERVICE COVERAGE

##### 4.1 Water Supply

##### 4.1.3 Level III Systems

Table 4.1.1 Details on Existing Level III Systems  
Sheet 1

Name of Municipality	Name of Operating Body	Level III Service								
		Number of Barangays Served			Number of Households Served			Number of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Asuncion	Asuncion WW	1		1	200		200	1,200		1,200
	Magatos WW		1	1		92	92		552	552
	Municipal Total	1	1	2	200	92	292	1,200	552	1,752
Carmen	Carmen WD	1		1	241		241	1,446		1,446
	Magsaysay WW		1	1		84	84		504	504
	Minda WW		1	1		176	176		1,056	1,056
	Municipal Total	1	2	3	241	260	501	1,446	1,560	3,006
Island Garden City of Samal	Gabuyan WW		1	1		68	68		408	408
	Kapalong LGU WW	1		1	106		106	636		636
	Narra WW		1	1		105	105		630	630
	Maniki RWW	1		1	357		357	2,142		2,142
	Municipal Total	2	2	4	463	173	636	2,778	1,038	3,816
Kapalong	Gabuyan WW		1	1		68	68		408	408
	Kapalong LGU WW	1		1	106		106	636		636
	Narra WW		1	1		105	105		630	630
	Maniki RWW	1		1	357		357	2,142		2,142
	Municipal Total	2	2	4	463	173	636	2,778	1,038	3,816
New Corella	Limbaan WW		1	1		168	168		1,008	1,008
	New Corella WD	1	2	3	346	30	376	2,256	180	2,436
	Municipal Total	1	3	4	346	198	544	2,256	1,188	3,444
Panabo	Panabo WD	4	4	8	765	398	1,163	4,590	2,388	6,978
Santo Tomas	Kiniamon WWA		1	1		130	130		780	780
	Marscon WW	1		1	339		339	1,695		1,695
	Tibal-og WW	1		1	2,223		2,223	13,338		13,338
	Municipal Total	2	1	3	2,562	130	2,692	15,033	780	15,813
Tagum City	Tagum WD	5	6	11	6,675	6,679	13,354	40,050	40,074	80,124
	Visayan Vill. WW	1		1	590		590	3,540		3,540
	Madaun WW		1	1		226	226		1,356	1,356
	La Filipina WW		2	2		441	441		2,646	2,646
	Makabayan WW		1	1		224	224		1,344	1,344
	San Miguel WW		1	1		304	304		1,824	1,824
	Floraville Home WW		1	1		100	100		600	600
	Municipal Total	6	12	18	7,265	7,974	15,239	43,590	47,844	91,434
<b>Provincial Total</b>		<b>20</b>	<b>26</b>	<b>46</b>	<b>12,507</b>	<b>9,295</b>	<b>21,802</b>	<b>74,883</b>	<b>55,770</b>	<b>130,653</b>

Table 4.1.1 Details on Existing Level III Systems (Cont'd)

Sheet 2

Name of Municipality	Name of Operating Body	Level II Service								
		Number of Public Faucets			Number of Households Served			Number of Population Served		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Asuncion	Asuncion WW									
	Magatos WW									
	Municipal Total									
Carmen	Carmen WD									
	Magsaysay WW									
	Minda WW									
	Municipal Total									
Island Garden City of Samal	Samal WD									
	Kaputian Pob. (South) WW	4		4	24		24			
	Kaputian Pob. WW									
	Tonil WW									
	Municipal Total	4		4	24		24			
Kapalong	Gabuyan WW									
	Kapalong LGU WW									
	Narra WW									
	Maniki RWW									
	Municipal Total									
New Corella	Limbaan WW									
	New Corella WD									
	Municipal Total									
Panabo	Panabo WD									
Santo Tomas	Kimamon WWA									
	Marscon WW									
	Tibal-og WW									
	Municipal Total									
Tagum City	Tagum WD									
	Visayan Vill. WW									
	Madaum WW									
	La Filipina WW									
	Makabayan WW									
	San Miguel WW									
	Floraville Home WW									
	Municipal Total									
<b>Provincial Total</b>		4	4	24	24					

Table 4.1.1 Details on Existing Level III Systems (Cont'd)

Name of Municipality	Name of Operating Body	Water Sources			Consumption			
		Type <sup>1</sup>	Number	Production (cu.m/day)	Domestic	Institutional	Commercial	Industrial
					(cu.m/day)			
Asuncion	Asuncion WW	DW	1					
	Magatos WW	DW			41	2		0
	Municipal Total	DW	1		41	2		0
Carmen	Carmen WD	DW/Oth	2	187				
	Magsaysay WW	DW			33			
	Minda WW	DW	3	1,679				
	Municipal Total	DW/Oth	5	1,866	33			
Island Garden City of Samal	Samal WD	Surf						
	Kaputian Pob. (South) WW	SP	1	1,635				
	Kaputian Pob. WW	SP						
	Toril WW	SP	1	109				
Municipal Total	SP/Surf	2	1,744					
Kapalong	Gabayon WW	DW						
	Kapalong LGU WW	DW	1					
	Narra WW	DW						
	Maniki RWW	DW	1	486	684			
	Municipal Total	DW	2	486	684			
New Corella	Limbaan WW	SP	1					
	New Corella WD	SP	2	337	227	17	17	
	Municipal Total	SP	3	337	227	17	17	
Panabo	Panabo WD	DW/SW	4	2,444		2		
Santo Tomas	Kimamon WWA	DW	1	240		6		
	Marscon WW	DW						
	Tibal-og WW	DW	3	2,608	1,343		126	
	Municipal Total	DW	4	2,848	1,343	6	126	
Tagum City	Tagum WD	DW	6	527				36
	Visayan Vjll. WW	DW	3	599				
	Madauni WW	DW						
	La Filipina WW	DW	1	327	217			
	Makabayan WW	DW						
	San Miguel WW	DW	1	291	174	31		
	Floraville Home WW	DW						
Municipal Total	DW	11	1,744	391	31		36	
<b>Provincial Total</b>			<b>32</b>	<b>11,469</b>	<b>2,720</b>	<b>58</b>	<b>179</b>	<b>0</b>

Note: 1. Type of Water Source; DW - Deep Well, DgW - Dug Well, Surf - Surface Water (River), SP - Spring.

Table 4.1.1 Details on Existing Level III Systems (Cont'd)

Name of Municipality	Name of Operating Body	Consumers														
		Domestic House Connections			Domestic Public Faucets			Institutional Consumers			Commercial Consumers			Industrial Consumers		
		Connection		Consumption (m <sup>3</sup> /day)	Connection		Consumption (m <sup>3</sup> /day)	Connection		Consumption (m <sup>3</sup> /day)	Connection		Consumption (m <sup>3</sup> /day)	Connection		Consumption (m <sup>3</sup> /day)
		Metered	Unmetered		Metered	Unmetered		Metered	Unmetered		Metered	Unmetered		Metered	Unmetered	
Asuncion	Asuncion WW		200					2								
	Magatos WW	92		41.48				2		2.13				1	0.38	
	Municipal Total	92	200	41.48				2	2	2.13				1	0.38	
Carmen	Carmen WD	196						1			45					
	Magsaysay WW	84		33.00												
	Minda WW															
	Municipal Total	280		33.00				1			45					
Island Garden City of Samal	Samal WD		350													
	Kaputian Pob. (South) WW		130													
	Kaputian Pob. WW		138													
	Toril WW	70														
	Municipal Total	70	618													
Kapatong	Gabuyan WW	68														
	Kapatong LGU WW	166	11													
	Narra WW	105														
	Maniki RWW			357.00			327.00									
	Municipal Total	279	11													
Panabo	Panabo WD	1,163						17	2.30	213						
Santo Tomas	Kimamon WWA		130					2	6.00							
	Marscon WW	339						1								
	Tibal-og WW	2,223		1,343.00						346	126.00					
	Municipal Total	2,562	130	1,343.00				3	6.00	346	126.00					
Tagum City	Tagum WD	13,354								921	35.70					
	Visayan Vill. WW	395	190					2		3						
	Madaam WW	226														
	La Filipina WW	437	4	216.66												
	Makabayan WW	224														
	San Miguel WW	304		174.00				8	30.90							
	Floraville Home WW		100													
	Municipal Total	14,940	294	390.66				10	30.90	924	35.70					
<b>Provincial Total</b>		<b>19,202</b>	<b>1,353</b>	<b>2,219</b>				<b>34</b>	<b>2</b>	<b>27.03</b>	<b>1,550</b>		<b>178.60</b>	<b>1</b>	<b>0.38</b>	



4.1.4 Level III System

Table 4.1.2 Details on Existing Level II Systems  
Sheet 1 of 6

Name of Municipality	Name of Operating Body	Water Source			Existing Facilities				
		Type	Number	Discharge (m <sup>3</sup> /day)	Length of Transmission Line (meter)	Reservoir Number	Reservoir Volume (m <sup>3</sup> )	Length of Distribution Line (meter)	Number of Public Faucets
Asuncion	Santo Niño WW	DW	1	69.1	25	1	35.0	1,500	5
	Sawata WW	DW	1		200	1	4.0	2,000	10
	<b>Municipal Total</b>		<b>2</b>	<b>69.1</b>	<b>225</b>	<b>2</b>	<b>39.0</b>	<b>3,500</b>	<b>15</b>
New Corella	Mesa-oy RWSA	SP	1	345.6	5,200	2	30.0	1,000	21
	Adecor WW	SP	1			1	27.0	3,000	28
	Anonang WW	SP	1	545.0	200	2	15.2	3,000	18
Island Garden City of Samar	Cogon WW	Taken from Toril WW		109.0	4,000	1	20.0	2,000	5
	Del Monte WW	DW	1		900	2	16.0	1,500	10
	Guilon WW	SP	1	86.4	1,000	1	8.0	2,000	10
	Kanaan WW	SP	1	172.8	3,000	1	8.0	1,000	9
	Libertad WW	Taken from Sion WW			5,000	1	8.0	2,000	15
	Libuak WW	Taken from San Antonio WW		163.6	2,000	1	17.0	1,000	3
	Pangubatan WW	SP	1	518.4	1,500				13
	San Antonio WW	SP	4	163.6	7,000		39.0	4,000	15
	San Isidro WW	SP	3	518.4	4,000	1	8.0	2,000	6
	San Remigio WW	SP	1		3,000	1	8.0	1,000	13
	Sion WW	SP	1	734.4	1,500	1	8.0	1,000	7
	Sitio 16, Kaputian P.	SP	1		400				12
	Kapalong	Tagbaobo WW	Taken from Anonang WW		545.0	3,000	1	8.0	1,000
Tagbay WW		SP	1	86.0	500	1	8.0	2,500	9
Tagbitan-ag WW		SP	1	129.6	1,500	1	8.0	3,000	15
<b>Municipal Total</b>		DW/SP	1/17	<b>3,772.2</b>	<b>38,500</b>	<b>16</b>	<b>206.2</b>	<b>30,000</b>	<b>201</b>
Monte Dujali WW		SP	1	3.4	1,000				3
Panabo	Mabunao WS	DW	1		100	1	37.9	3,000	11
	Sindaton WW	DW	1		20	1	75.8	600	3
	Tibungol WW	DW	1	190.8	50	1	113.6	1,000	9
	<b>Municipal Total</b>	DW	<b>3</b>	<b>190.8</b>	<b>170</b>	<b>3</b>	<b>227.3</b>	<b>4,600</b>	<b>23</b>
	Bobongon WW	DW	1		100	1	45.5	1,000	33
Santo Tomas	Balagunan WW	DW	1		100	1	45.5	1,500	30
	<b>Municipal Total</b>	DW	<b>2</b>		<b>200</b>	<b>2</b>	<b>91.0</b>	<b>2,500</b>	<b>63</b>
	LGU	SP	1	129.6	50	1	2.7	60	6
Talaingod	Aison WW (Pvt)	DW	1		800	1	5.0		30
	<b>Municipal Total</b>	DW/SP	1/1	<b>129.6</b>	<b>850</b>	<b>2</b>	<b>7.7</b>	<b>60</b>	<b>36</b>
	<b>Provincial Total</b>		<b>29</b>	<b>4,381.1</b>	<b>45,295</b>	<b>25</b>	<b>593.5</b>	<b>41,600</b>	<b>326</b>

Note: 1. Type of Water Source: DW - Deep Well, DgW - Dug Well, Surf - Surface Water (River), SP - Spring, and IG - Infiltration Gallery

Table 4.1.2 Details on Existing Level II Systems  
Sheet 2 of 6

Name of Municipality	Name of Operating Body	Number of Barangay Served			Number of Households Served			Number 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
	<b>Municipal Total</b>		3	3		200	200		1,200	1,200
New Corella	Mesa-oy RWSA		1	1		480	480		2,880	2,880
	Adecor WW		1	1		350	350		2,100	2,100
	<b>Municipal Total</b>		2	2		830	830		4,980	4,980
Island Garden City of Samar	Anonang WW		1	1		300	300		1,800	1,800
	Cogon WW		1	1		100	100		600	600
	<b>Municipal Total</b>		2	2		400	400		2,400	2,400
Island Garden City of Samar	Del Monte WW		1	1		111	111		666	666
	Guilon WW		1	1		100	100		600	600
	<b>Municipal Total</b>		2	2		211	211		1,266	1,266
Island Garden City of Samar	Kanaan WW		1	1		152	152		912	912
	Libertad WW		1	1		178	178		1,068	1,068
	<b>Municipal Total</b>		2	2		330	330		2,080	2,080
Island Garden City of Samar	Libuak WW		1	1		46	46		276	276
	Pangubatan WW		1	1		260	260		1,560	1,560
	<b>Municipal Total</b>		2	2		306	306		1,836	1,836
Island Garden City of Samar	San Antonio WW		1	1		190	190		1,140	1,140
	San Isidro WW		1	1		77	77		462	462
	<b>Municipal Total</b>		2	2		267	267		1,602	1,602
Island Garden City of Samar	San Remigio WW		1	1		182	182		1,092	1,092
	Sion WW		1	1		150	150		900	900
	<b>Municipal Total</b>		2	2		332	332		1,992	1,992
Kapalong	Sitio 16, Kaputian P	1		1	126	126	126	756		756
	Tagbaobo WW		1	1		183	183		1,098	1,098
	<b>Municipal Total</b>	1	1	2	126	309	309	756	1,098	1,854
Kapalong	Tagbay WW		1	1		90	90		540	540
	Tagbitan-ag WW		1	1		150	150		900	900
	<b>Municipal Total</b>		2	2		240	240		1,440	1,440
Kapalong	Monte Dujali WW		16	17	126	2,619	2,745	756	14,027	14,783
	Mabunao WS		1	1		60	60		360	360
	<b>Municipal Total</b>		17	18	126	2,679	2,805	756	14,387	15,143
Panabo	Sindaton WW		1	1		110	110		660	660
	Tibungol WW		1	1		30	30		180	180
	<b>Municipal Total</b>		2	2		140	140		840	840
Santo Tomas	Bobongon WW		3	3		230	230		1,380	1,380
	Balagunan WW		1	1		272	272		1,632	1,632
	<b>Municipal Total</b>		4	4		502	502		3,012	3,012
Talaingod	LGU		2	2		500	500		3,000	3,000
	Aison WW (Pvt)		1	1		50	50		300	300
	<b>Municipal Total</b>		3	3		550	550		3,300	3,300
<b>Provincial Total</b>		1	27	28	126	4,199	4,325	756	23,507	24,263

Table 4.1.2 Details on Existing Level II Systems  
Sheet 3 of 6

Name of Municipality	Name of Operating Body	Supply (Hrs/day)	Dirty Water <sup>1</sup>	Taste or Smell <sup>2</sup>	Service Conditions During Dry Season							Supply Water Pressure (% of total)									
					Supply Interruption (number/month)				Supply Interruption (number/month)			Adequate	Inadequate								
					Power Failure	Pump Breakdown	Pipe Burst	Others	Power Failure	Pump Breakdown	Pipe Burst			Others							
Asuncion	Santo Niño WW																				
	Sawata WW																				
New Corella	Mesa-oy RWSA			G																	25
Island Garden City of Samal	Adecor WW		O	G																	
	Anonang WW			G																	50
	Cogon WW			G																	
	Del Monte WW																				
	Guilon WW		O	G																	
	Kanaar WW																				
	Libertad WW																				
	Libuak WW	24																			
	Pangubatan WW	24	O	G																	
	San Antonio WW	24																			
	San Isidro WW	24																			
	San Remigio WW	24		G																	
	Stion WW		O	G																	
	Sitio 16, Kaputian Pob. WW			G																	
	Tagbaobo WW																				
	Tagbay WW			G																	
	Tagbitan-ag WW			G																	
Kapalong	Monte Dujali WW			G																	
Panabo	Mabunao WS			G																	
	Sindaton WW	24	O	G																	
	Tibungol WW	24	O	G																	
Santo Tomas	Bobongon WW																				
	Balagunan WW																				
Talaingod	LGU	24		G																	
	Alson WW (Pvt)	24																			

Note: 1. Dirty Water: E - Everyday, OW - Once a week, OM - Once a month, O - Occasional.  
2. Taste or Smell: G - Good taste, S - Salty, W - Wood taste, M - Metallic taste, O - Others.

Table 4.1.2 Details on Existing Level II Systems

Sheet 4 of 6

Name of Municipality	Name of Operating Body	Technical Staff	Administrative Staff	Collector	Number of Staff			Repair Work		
					Total Number of Staff	Local Tradesman	MEO/CEO	DEO	Others	
Asuncion	Santo Niño WW	1	1	2	4					
	Sawata WW	1	1	2	4					
New Corella	Mesa-oy RWSA		6		6	✓				
	Adecor WW	2	1	5	6	✓			BWSA	
	Anonang WW	1		18	3	✓			BWSA	
	Cogon WW	1	1	1	3				RWSA	
	Del Monte WW		1	10	11	✓			BWSA	
Island Garden City of Samar	Guilon WW		Barangay Council							Brgy. Off.
	Kanaan WW		2	1	3					Coop.
	Libertad WW		1	2	3					
	Libuak WW		Barangay Council							Brgy.
	Pangubatan WW		1	3	4	✓				RWSA
	San Antonio WW		Barangay Council							
	San Isidro WW		1	3	4					RWSA
	San Remigio WW		1	2	3					RWSA
	Sion WW		1	1	2					RWSA
	Sitio 16, Kaputian Pob. WW									
	Tagbaobo WW		1	1	2					RWSA
	Tagbay WW		Barangay Council							Brgy. Off.
	Kapalong	Tagbitan-ag WW		Barangay Council						
Monte Dujali WW			1	1	1					Brgy. Off.
Mabunao WS			Barangay Council							Brgy. Off.
Sindaton WW			Barangay Council							Brgy. Off.
Panabo	Tibungol WW	1	1	1	3					TADECO
	Bobongon WW									Coop.
Santo Tomas	Balagunan WW									Coop.
	LGU									
Talaingod	Alson WW (Pvt)							✓		

Table 4.1.2 Details on Existing Level II Systems  
Sheet 5 of 6

Name of Municipality	Name of Operating Body	Expenditures (P '000.00 / year)							Tariff (Pesos)				Average Collection Efficiency (%)		
		Annual	Wages	Fuel, Chem.	Transport	Repairs	Loan Repayment	Other	Consumer Payment (Year)	Cost per Cu.	Cost/HH/Year	Other			
Asuncion	Santo Niño WW	9	1.5	5		2.5						120		65	
	Sawata WW	6										120		35	
	Mesa-oy/RWSA	32.22	7.92			21.6		2.7				120		45	
	Adecor WW	1.6	1			0.6						60		80	
	Anonang WW	8	7.2			0.8						60		50	
	Cogon WW	7.5	4			3.5						120		60	
	Del Monte WW	26	3	22.8		1						300		85	
	Guilon WW		8.5	5		3.5						60		85	
	Kanaan WW	16	14	12		2						180		65	
	Libertad WW	4.5	2.5			2						120		50	
	Libuak WW											free		50	
	Pangubatan WW	4	1.5			3						free		50	
Kapalong	San Antonio WW	2.5	2.5	1		1.5						120		60	
	San Isidro WW	6.5	6	3.5		2.5						120		60	
	San Remigio WW	5	1.5			3.5						120		60	
	Sion WW	5.2	4			0.2		1				120		90	
	Sito 16, Kaputian P.	5	5	2		3						120		50	
	Tagbaobo WW		7									120		70	
	Tagbay WW		8.5	3		4		1.5				120		70	
	Tagbitan-ag WW	1.5				1.5						12		80	
	Monte Duñali WW	76	25	24	2	20		5				1		100	
	Mabunao WS	14.6	4.2	8.4		2							240		90
	Sindaton WW														
	Tibungol WW														
Santo Tomas	Bobongon WW														
	Balagunan WW														
Talaingod	LGU											free			
	Alson WW (Pvt)											free			

Table 4.1.2 Details on Existing Level II Systems

Sheet 6 of 6

Name of Municipality	Name of Operating Body	Billings				Revenues					
		Annual Billing P '000.00	Public Faucet Consume	House Connection Consumers	Expected Subsidies	Others	Annual Income (P '000.00 / year)	Payment by Public Faucet Consumers	Payment by House Connection	Subsidies	Other
Asuncion	Santo Niño WW						9				
	Sawata WW						6				
New Corella	Mesa-oy RWSA	18	18				57	18		39	
	Adecor WW						1.6				
Island Garden City of Samal	Anonang WW						8.4				
	Cogon WW						8	3.68	4.32		
Kapalong Panabo	Del Monte WW						28				
	Guilon WW	10					16	16			
	Kanaan WW						5				
	Libertad WW										
	Libuak WW										
	Pangubatan WW						4.806				
	San Antonio WW										
	San Isidro WW						2.5				
	San Remegio WW						6.5				
	Sion WW						5				
	Sitio 16, Kaputian Pob. WW						7.56	7.56			
	Tagbaobo WW						5				
	Tagbay WW	7.2									
	Tagbitan-ag WW	9.2									
	Monte Dujali WW										
	Mabunao WS	108						1.884	1.884		
	Sindaton WW	16.806									
	Tibungol WW										
	Bobongon WW										
	Balagunan WW										
LGU											
Talaingod	Alson WW (Pvt)										

#### 4.1.5 Level I Facilities

##### Safe and Unsafe Classification of Level I Facilities

According to the definition of DOH, protected deep well, protected shallow well, covered/improved dug well and developed spring are classified as safe sources, while unprotected shallow well, open dug well, undeveloped spring and rain water collector are classified as unsafe sources.

In the 1990 population census data on "Households by Main Source of Drinking Water and City/Municipality", it was shown that 40% of the households depended on shallow well, dug well, undeveloped spring, lake, river and rain water collector, etc. This figure was considered as the upper limit of doubtful sources in terms of underserved/unserved, if all shallow wells were regarded as doubtful.

As for water sources in the province, the PHO classifies dug well and rainwater collector as doubtful sources (regarded as unsafe sources). Based on the "Environmental Health Service, CY 1997" Report, the number of households using safe and unsafe Level I sources is summarized as shown in Table 4.1.3.

**Table 4.1.3 Household Served by Level I**

Total Households using Level I facility	Households Served by Safe Sources		Households Served by Doubtful Sources	
	Number	Percentage	Number	Percentage
76,348	58,945	77 %	17,403	23 %

Source: PHO

The table shows that 23% of the households using Level I facilities depend on dug wells and rainwater collectors. Generally, the unsafe percentage of shallow wells is lower than that of dug wells and rainwater collector/unknown sources. In the absence of information on shallow wells (about 20% of the households served by Level I at present), it may be assumed that the unsafe percentage of shallow wells is more or less the same as that of dug wells/rainwater collector.

On the other hand, the experiences during the study for 1<sup>st</sup> batch provinces in Mindanao area showed that around 20-50 % was considered as unsafe sources as shown below.

Surigao del Norte	Agusan del Norte	Agusan del Sur	Davao Oriental	Davao del Sur
20 %	50 %	23 %	40 %	46%

Taking into account these experiences, the minimum percentage of 20% in the 1<sup>st</sup> batch study may be adopted as an unsafe percentage to the whole province in the classification of existing shallow wells. While, those sources other than shallow wells are processed as classified in the questionnaire. Table 4.1.4 presents the number of Level I facilities by safe and unsafe classification.

#### **Public and Private Level I Facilities for Rural Water Supply**

Table 4.1.4 (b) presents the number and proportion of Level I facilities by public and private sources for rural water supply in the province. Public and private facilities share 4.6% and 95.4% of the total number of Level I facility, respectively. Developed springs occupy 8% of the total number of public facilities.

**Table 4.1.4 (b) Public and Private Level I Facilities for Rural Water Supply**

Facility	Public Source		Private Source		Total
	Number	%	Number	%	
Deep Well	559	47.8	610	52.2	1,169
Shallow Well	751	11.7	5,689	88.3	6,440
Spring Development	133	100	0	0	133
Others	171	0.6	26,867	99.4	27,038
<b>Total</b>	<b>1,614</b>	<b>4.6</b>	<b>33,166</b>	<b>95.4</b>	<b>34,780</b>

#### **4.1.6 Water Supply Service Coverage**

##### **Estimation of Service Coverage in Terms of Safe, Unsafe and Unserved Classification**

Through review of the number of water supply systems/facilities and the number of households that were derived from the questionnaire, it was found out that a great number of unserved population would be accounted as the balance between the total population and the population with any levels of services (including unsafe facilities) by applying the service level standard for Level I and II. To come up with more realistic service coverage, the unserved population in 1997 was referred to using the profile in the 1990 population census data on "Households by Main Source of Drinking Water and City/Municipality" prepared by NSO. The rest of the population, those who are not served by Level III and/or II systems, were considered to be covered by shared or own use of Level I facilities. The calculation procedure is as follows:



Table 4.1.4 Number of Level 1 Facilities by Safe and Unsafe Classification

Name of Municipality	Area	Safe Sources										Unsafe Source							Grand Total					
		Public					Private					Public			Private									
		Deep Well	Shallow Well	Covered/Improved Dug Well	Developed Spring	Sub-total	Deep Well	Shallow Well	Covered/Improved Dug Well	Sub-total	Total	Shallow Well	Open Dug Well	Undeveloped Spring	Rain Water Collection	Sub-total	Shallow Well	Open Dug Well		Rain Water Collector	Sub-total	Total		
Asuncion	Urban	8	13	13	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
	Rural	85	113	85	27	310	52	81	10	143	453	28	31	20	3	31	20	1,325	222	1,567	1,598	2,051		
	Total	93	113	98	27	331	52	81	10	143	474	28	31	20	3	31	20	1,325	222	1,767	1,798	2,272		
Braulio E. Dujali	Urban	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	Rural	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	Total	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Carmen	Urban	2	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Rural	2	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Total	2	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Island Garden City of Sual	Urban	9	40	2	4	53	22	11	66	79	86	1	12	3	19	3	5,840	3,061	8,906	8,924	9,010	9,171		
	Rural	95	31	20	146	199	5	5	151	8	16	1	9	5,449	5,459	5,475	5,626	5,677	5,682	5,687	5,687			
	Total	104	71	24	199	27	27	27	226	18	8	26	7	9	5,925	5,941	5,967	6,193	6,193	6,193	6,193			
Kapalong	Urban	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Rural	186	70	10	15	281	292	225	14	531	812	18	18	18	18	18	56	247	33	336	354	1,169		
	Total	202	70	10	15	297	303	245	14	562	859	18	18	18	18	18	56	247	33	341	359	1,218		
New Corella	Urban	56	5	29	90	90	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Rural	56	5	29	90	90	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Total	56	5	29	90	90	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Panabo	Urban	2	7	2	11	157	1,160	5	1,322	1,333	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Rural	77	59	20	156	224	2,517	32	2,773	2,929	15	15	15	15	15	15	629	886	3,434	4,949	4,964	7,893		
	Total	79	66	22	167	381	3,677	37	4,095	4,262	17	17	17	17	17	17	629	886	3,434	4,949	4,964	7,893		
Santo Tomas	Urban	6	16	2	22	22	5	238	265	4	4	4	4	4	4	4	60	20	415	495	499	764		
	Rural	54	224	9	3	290	17	1,354	1,371	1,661	56	56	56	56	56	56	338	480	451	1,269	1,325	2,986		
	Total	60	240	9	3	312	22	1,592	1,614	1,926	60	60	60	60	60	60	398	500	866	1,764	1,824	3,730		
Tagum City (Capital)	Urban	20	20	20	20	20	15	12	27	47	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Rural	52	9	18	7	86	12	229	139	380	466	2	7	7	7	7	7	7	7	7	7	7	7	
	Total	72	9	18	7	106	27	241	139	407	513	2	7	7	7	7	7	7	7	7	7	7	7	
Talaingod	Urban	10	19	4	12	45	5	25	30	75	5	5	5	5	5	5	5	5	5	5	5	5	5	
	Rural	10	19	4	12	45	5	25	30	75	5	5	5	5	5	5	5	5	5	5	5	5	5	
	Total	10	19	4	12	45	5	25	30	75	5	5	5	5	5	5	5	5	5	5	5	5	5	
Provincial Total	Urban	61	63	15	4	143	188	1,453	5	1,646	1,789	16	16	16	16	16	28	363	1,420	3,865	5,585	5,616	7,405	
	Rural	559	601	135	133	1,428	610	4,551	261	5,422	6,850	156	156	156	156	156	1,138	11,962	14,644	27,744	27,930	34,780		
	Total	620	664	150	137	1,571	793	6,004	266	7,068	8,639	166	166	166	166	166	214	1,501	13,582	18,449	33,332	33,546	42,185	

- Service percentage/population of Level III and Level II systems was estimated based on the questionnaire survey results.
- Percentage of unserved population (using undeveloped spring, lake water, river water, peddler, etc.) of the respective municipality by urban and rural area, which were studied in the 1990 population census, was discounted to half of their percentage, since the figures were estimated based on a 10% sample and the situation at that time seems to have been improved.
- Population covered by Level I facilities was calculated as the balance between the total population and the population served by Level III & II systems and the unserved population.
- Level I population coverage was estimated with the assumption that 50% of the private facilities were shared by neighbors.

Unserved population and the population covered by Level I facilities are presented in Table 4.1.5. Table 4.1.6 presents the overall population covered by Level I facilities and the number of households.

The majority of the number of households per shared public/private facility ranges from 2 to 24 households in the rural areas and from 2 to 28 households in the urban areas. Compared with the service level standard of Level I public facility (15 households/facility), these figures are within the acceptable range. However, the figures in the urban area of Tagum City are considered quite high. This reason seems to arise from a very few number of shared facility (about 30 units of safe sources) and those beneficiaries that may be considered as fetching water from nearby individual faucets of neighbors.

#### **Percentage of Population Covered by Level I Public Facility for Rural Water Supply**

Grasping the current percentage of population covered by public facilities would be a useful information in considering as to what extent the additional population to be covered by public facilities in the future plan. This takes into account that the major facilities would be Level I especially for rural water supply in the future.

Population covered by public facilities is calculated as the balance between the total population served by Level I facilities and the population covered by private facilities. Thus, it is estimated at 44,900 persons or 31% of the total population is covered by public Level I facilities based on the figures shown in Tables 4.1.6 (a) and 4.1.6 (b).

Table 4.1.5 Estimation of Unserved Population by Municipality

Name of Municipality	Area	Population and Household (1998)		Served Population			Unserved Population			Population Covered by Level I Facilities	
		Number	HH/Size	Level III	Level II	Total	Total No. of HHs	No. of Unserved	% Unserved		Unserved Population 1998
Asuncion	Urban	7,325	5.16	1,200		1,200	1,400	253	18	1,321	4,804
	Rural	50,556	5.19	552	1,200	1,752	9,601	1,316	14	6,930	41,874
	Total	57,881	5.19	1,752	1,200	2,952	11,001	1,569	14	8,253	46,678
Braulio E. Dujali	Urban						3,033	340	11	1,746	13,831
	Rural	15,577	4.72				3,033	340	11	1,746	13,831
	Total	15,577	4.72			1,446	1,580	1,320	84	7,270	
Carmen	Urban	8,716	5.15	1,446		1,446	8,472	1,148	14	6,225	38,152
	Rural	45,937	5.07	1,560		1,560	10,052	2,468	25	13,419	38,152
	Total	54,653	5.08	3,006		3,006	10,052	2,468	25	13,419	38,152
Island Garden City of Samal	Urban	16,733	5.07	3,990	756	4,746	3,099	612	20	3,302	8,685
	Rural	65,126	5.13	420	14,027	14,447	11,955	3,185	27	17,351	33,328
	Total	81,859	5.11	4,410	14,783	19,193	15,054	3,797	25	20,644	42,014
Kapalong	Urban	10,224	5.17	2,778		2,778	1,915	445	23	2,373	5,073
	Rural	53,930	4.93	1,038	360	1,398	10,596	2,317	22	11,790	40,742
	Total	64,154	4.97	3,816	360	4,176	12,511	2,761	22	14,158	45,815
New Corella	Urban	8,389	5.33	2,256		2,256	1,459	1,067	73	6,133	
	Rural	36,514	5.36	1,188	2,880	4,068	6,309	1,013	16	5,863	26,583
	Total	44,903	5.36	3,444	2,880	6,324	7,768	2,080	27	12,023	26,583
Panabo	Urban	47,762	5.06	4,590		4,590	8,605	512	6	2,839	40,333
	Rural	85,598	5.17	2,388	1,380	3,768	15,078	2,666	18	15,132	66,698
	Total	133,360	5.13	6,978	1,380	8,358	23,683	3,177	13	17,890	107,031
Sanro Tomas	Urban	29,421	5.24	15,033		15,033	5,247	51	1	283	14,105
	Rural	53,201	5.11	780	3,000	3,780	9,723	264	3	1,445	47,976
	Total	82,622	5.16	15,813	3,000	18,813	14,970	315	2	1,736	62,081
Tagum City (Capital)	Urban	91,030	5.22	43,590		43,590	16,113	205	1	1,158	46,282
	Rural	78,334	5.10	47,844		47,844	14,207	1,068	8	5,889	24,601
	Total	169,364	5.16	91,434		91,434	30,320	1,273	4	7,111	70,883
Talaingod	Urban							67			
	Rural	17,141	4.79	660		660	2,683	149	6	952	15,529
	Total	17,141	4.79	660		660	2,683	216	8	1,380	15,529
Provincial Total	Urban	219,600	5.17	74,883	756	75,639	39,418	4,530	11	24,679	119,282
	Rural	501,914	5.10	55,770	23,507	79,277	91,657	13,465	15	73,321	349,316
	Total	721,514	5.12	130,653	24,263	154,916	131,075	17,995	14	98,001	468,597

Table 4.1.6 (a) Estimation of Population Covered by Safe and Unsafe Source by Municipality

Name of Municipality	Area	Pop. Covered by Level I Facilities	Number of Facilities						Coverage of Own Use					
			Public Facilities			Private Facilities			Number of Private Facilities			(1) Population Covered		
			Safe	Unsafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total	Safe	Unsafe	Total
Asuncion	Urban	4,804	21		21		200			200	100		100	516
	Rural	41,874	310	341	143	1,567	1,710	71	784	855	368	4,043	4,412	
	Total	46,678	331	362	143	1,767	1,910	71	884	955	368	4,559	4,928	
Braulio E. Dujali	Urban													
	Rural	13,831	17	4	104	2,601	2,705	52	1,301	1,353				
	Total	13,831	17	4	104	2,601	2,705	52	1,301	1,353				
Carmen	Urban		12			695			348					
	Rural	38,152	6	19	79	8,906	8,985	40	4,453	4,493	204	22,932	23,136	
	Total	38,152	6	31	79	9,601	9,680	40	4,800	4,840	204	22,932	23,136	
Island Garden City of Samar	Urban	8,685	53	10	63	482	504	11	241	252	57	1,221	1,278	
	Rural	33,328	146	16	162	5,459	5,464	2	2,730	2,732	12	13,839	13,851	
	Total	42,014	199	26	225	5,941	5,968	14	2,970	2,984	69	15,060	15,129	
Kapalong	Urban	5,073	16	16	31	5	36	3	16	18	80	13	93	
	Rural	40,742	281	18	299	336	867	265	168	434	1,372	869	2,241	
	Total	45,815	297	18	315	341	903	281	171	452	1,452	882	2,334	
New Corella	Urban													
	Rural	26,583	90	14	104	185	193	4	93	97	21	493	514	
	Total	26,583	90	14	104	185	193	4	93	97	21	493	514	
Panabo	Urban	40,333	11	2	13	1,322	4,985	661	1,832	2,493	3,345	9,267	12,612	
	Rural	66,698	156	15	171	2,773	4,949	1,386	2,475	3,861	7,015	12,521	19,537	
	Total	107,031	167	17	184	4,095	8,612	2,047	4,306	6,354	10,360	21,789	32,149	
Santo Tomas	Urban	14,105	22	4	26	243	495	122	247	369	638	1,296	1,934	
	Rural	47,976	290	56	346	1,371	1,269	685	635	1,320	3,591	3,326	6,917	
	Total	62,081	312	60	372	1,614	3,378	807	882	1,689	4,229	4,622	8,850	
Tagum City (Capital)	Urban	46,282	20	20	27	49	76	14	25	38	70	128	198	
	Rural	24,601	86	7	93	380	2,461	190	1,231	1,421	991	6,424	7,415	
	Total	70,883	106	7	113	407	2,510	2,917	203	1,255	1,459	1,062	6,552	
Talangod	Urban													
	Rural	15,529	45	7	52	30	39	9	15	20	5	20		
	Total	15,529	45	7	52	30	39	9	15	20	5	20		
Provincial Total	Urban	119,282	143	28	171	1,646	5,588	7,234	823	2,794	3,617	4,190	12,441	
	Rural	349,316	1,428	186	1,614	5,422	27,744	33,166	2,711	13,872	16,583	13,575	64,448	
	Total	468,597	1,571	214	1,785	7,068	33,332	40,400	3,534	16,666	20,200	17,765	76,889	

Table 4.1.6 (b) Estimation of Population Covered by Safe and Unsafe Source by Municipality

Name of Municipality	Area	Coverage of Shared Well						Level I Coverage (1) + (2)							
		(2) Population Covered by Private and Public			Number of Households			No. of HHs per Shared Facility		Safe		Unsafe		Total	
		Safe	Unsafe	Total	Safe	Unsafe	Total	Facility	%	Pop.	%	Pop.	%	Pop.	%
Asuncion	Urban	834	3,454	4,288	162	669	831	7	834	11	3,970	54	4,804	66	
	Rural	13,347	24,116	37,463	2,572	4,647	7,218	6	13,715	27	28,159	56	41,874	83	
	Total	14,180	27,570	41,750	2,733	5,316	8,049	6	14,549	25	32,129	56	46,678	81	
Braulio E. Dujali	Urban														
	Rural	691	13,140	13,831	146	2,784	2,930	2	691	4	13,140	84	13,831	89	
	Total	691	13,140	13,831	146	2,784	2,930	2	691	4	13,140	84	13,831	89	
Carmen	Urban														
	Rural	388	14,627	15,016	77	2,885	2,962	1	592	1	37,560	69	38,152	70	
	Total	388	14,627	15,016	77	2,885	2,962	1	592	1	37,560	69	38,152	70	
Island Garden City of Samal	Urban	1,770	5,637	7,408	349	1,112	1,461	5	1,827	11	6,858	41	8,685	52	
	Rural	1,711	17,766	19,477	334	3,463	3,797	1	1,724	3	31,605	49	33,328	51	
	Total	3,481	23,403	26,885	683	4,575	5,258	2	3,550	4	38,463	47	42,014	51	
Kapalong	Urban	4,700	280	4,980	909	54	963	28	4,780	47	293	3	5,073	50	
	Rural	30,413	8,087	38,501	6,169	1,640	7,809	11	31,785	59	8,957	17	40,742	76	
	Total	35,113	8,367	43,480	7,078	1,695	8,773	11	36,565	57	9,249	14	45,815	71	
New Corella	Urban														
	Rural	12,463	13,606	26,069	2,325	2,538	4,864	24	12,484	34	14,099	39	26,583	73	
	Total	12,463	13,606	26,069	2,325	2,538	4,864	24	12,484	28	14,099	31	26,583	59	
Panabo	Urban	10,821	16,900	27,721	2,139	3,340	5,478	2	14,166	30	26,167	55	40,333	84	
	Rural	25,518	21,643	47,161	4,936	4,186	9,122	2	32,533	38	34,165	40	66,698	78	
	Total	36,339	38,543	74,882	7,074	7,526	14,601	2	46,699	35	60,332	45	107,031	80	
Santo Tomas	Urban	5,131	7,040	12,171	979	1,344	2,323	6	5,769	20	8,336	28	14,105	48	
	Rural	28,086	12,974	41,060	5,496	2,539	8,035	5	31,677	60	16,299	31	47,976	90	
	Total	33,217	20,014	53,231	6,476	3,882	10,358	5	37,446	45	24,635	30	62,081	75	
Tagum City (Capital)	Urban	26,732	19,352	46,083	5,121	3,707	8,828	152	26,802	29	19,480	21	46,282	51	
	Rural	4,481	12,705	17,186	879	2,491	3,370	2	5,473	7	19,129	24	24,601	31	
	Total	31,213	32,057	63,270	6,000	6,198	12,198	8	32,275	19	38,608	23	70,883	42	
Talaingod	Urban														
	Rural	13,053	2,476	15,529	2,725	517	3,242	45	13,053	76	2,476	14	15,529	91	
	Total	13,053	2,476	15,529	2,725	517	3,242	45	13,053	76	2,476	14	15,529	91	
Provincial Total	Urban	49,988	52,663	102,651	9,659	10,226	19,885	5	54,177	25	65,104	30	119,282	54	
	Rural	130,152	141,140	271,292	25,658	27,691	53,349	3	143,727	29	205,588	41	349,316	70	
	Total	180,139	193,804	373,943	35,317	37,917	73,234	3	197,905	27	270,693	38	468,597	65	

4.2 Sanitation and Sewerage  
 4.2.2 Types of Facilities and Definition of Service Level Standard

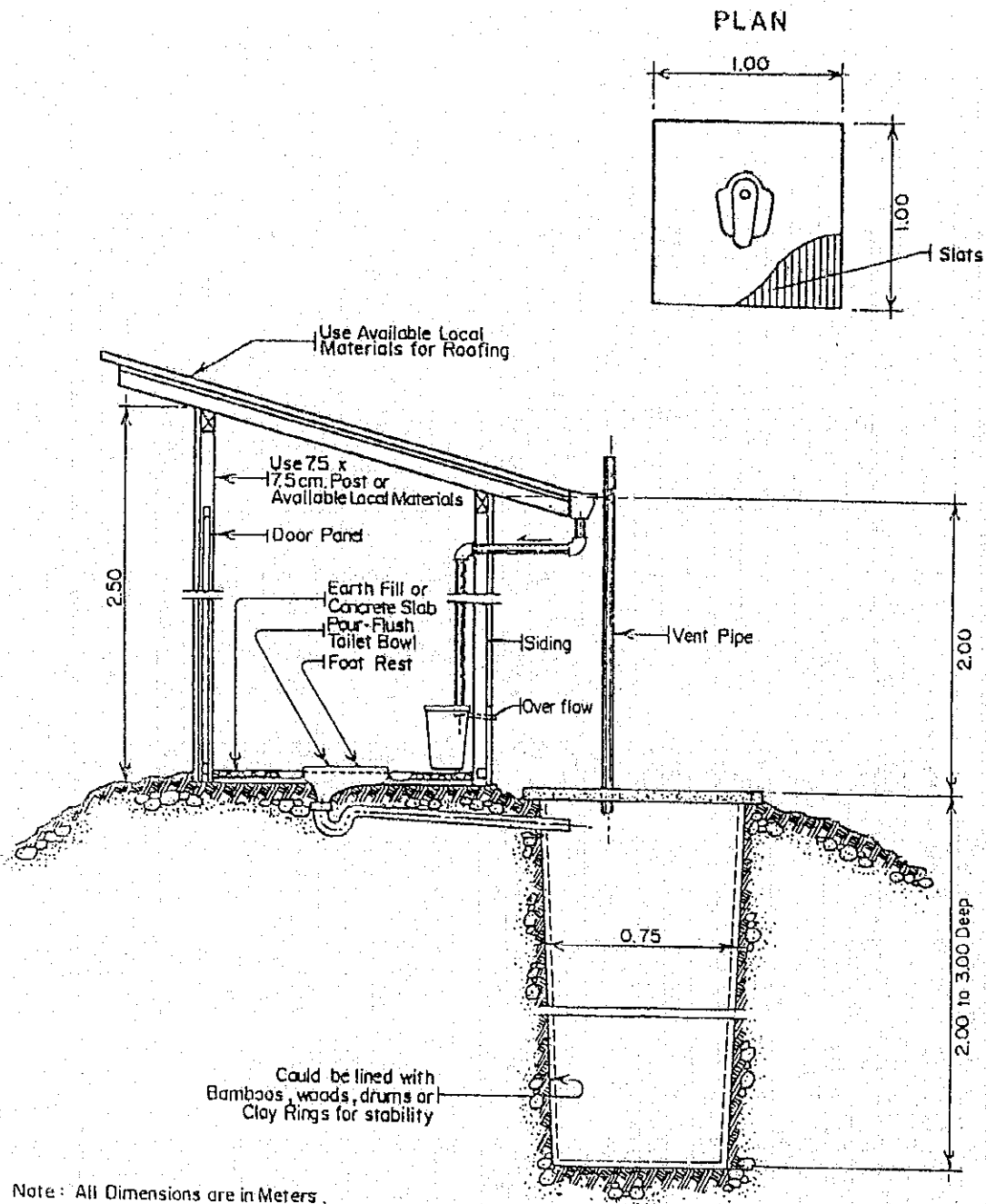
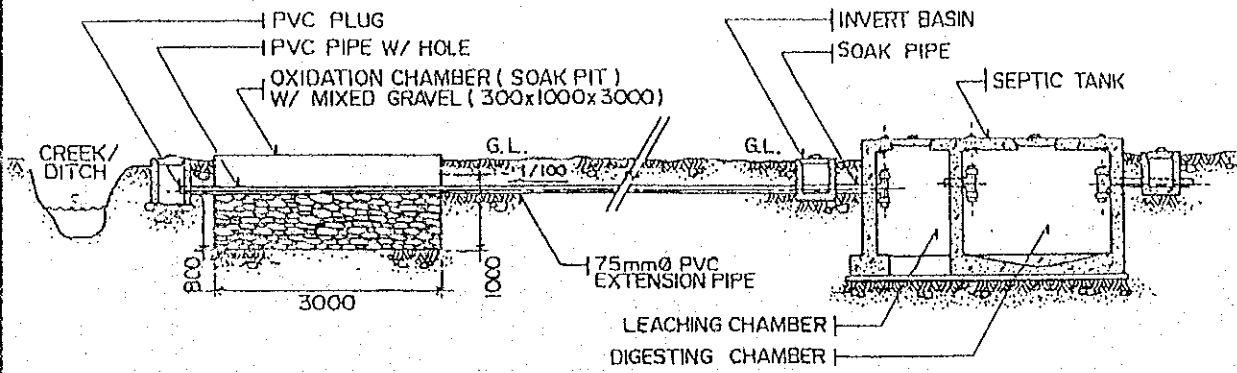


FIGURE 4.2.1  
 STANDARD STRUCTURE OF PRIVATE TOILET FACILITY

SOURCE : DEPARTMENT OF HEALTH



LAYOUT PLAN OF HIGH GROUND WATER SITE

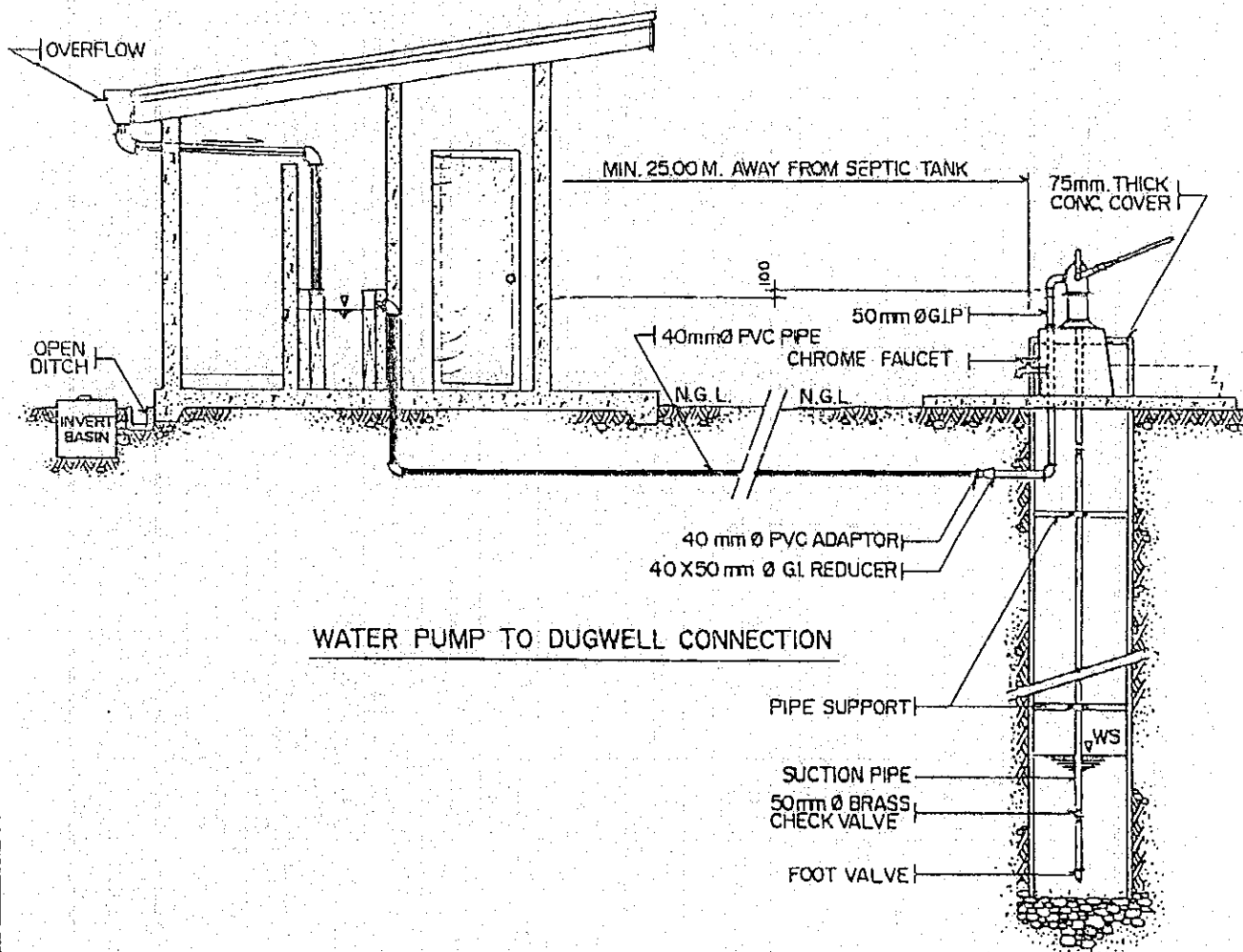


FIGURE 4.2.2  
STANDARD STRUCTURE OF SCHOOL TOILET FACILITY

4.2.3 Sanitation Facilities and Service Coverage

Table 4.2.1 Sanitation Facilities and Service Coverage of Household Toilets by Type, by Municipality, Urban and Rural 1997

Name of Municipalities	Area	No. of Households (1997)	Households Served by Sanitary Toilets						Underserved/Unserviced HHs					
			Flush Toilet		Pour Flush		VIP		Total		Unsanitary		No Facility	
			Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Asuncion	Urban	1,420	3	0	1,206	85	90	6	1,299	91	23	2	98	7
	Rural	9,741	0	0	7,145	73	245	3	7,390	76	974	10	1,377	14
	Total	11,161	3	0	8,351	75	335	3	8,689	78	997	9	1,475	13
Braulio E. Dujali	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	3,300	0	0	2,039	62	112	3	2,151	65	736	22	413	13
	Total	3,300	0	0	2,039	62	112	3	2,151	65	736	22	413	13
Carmen	Urban	1,692	53	3	768	45	169	10	990	59	552	33	150	9
	Rural	9,061	0	0	4,462	49	1,754	19	6,216	69	1,614	18	1,231	14
	Total	10,753	53	0	5,230	49	1,923	18	7,206	67	2,166	20	1,381	13
Island Garden City of Samar	Urban	3,300	7	0	2,076	63	173	5	2,256	68	524	16	520	16
	Rural	12,695	40	0	4,727	37	3,339	26	8,106	64	1,435	11	3,154	25
	Total	15,995	47	0	6,803	43	3,512	22	10,362	65	1,959	12	3,674	23
Kapalong	Urban	1,978	128	6	1,601	81	73	4	1,802	91	119	6	57	3
	Rural	10,939	0	0	1,989	18	5,453	50	7,442	68	2,286	21	1,211	11
	Total	12,917	128	1	3,590	28	5,526	43	9,244	72	2,405	19	1,268	10
New Corella	Urban	1,574	0	0	1,165	74	59	4	1,224	78	331	21	19	1
	Rural	6,812	0	0	2,716	40	1,740	26	4,456	65	1,616	24	740	11
	Total	8,386	0	0	3,881	46	1,799	21	5,680	68	1,947	23	759	9
Panabo	Urban	9,439	956	10	5,678	60	377	4	7,011	74	1,528	16	900	10
	Rural	16,557	0	0	7,864	47	3,956	24	11,820	71	2,779	17	1,958	12
	Total	25,996	956	4	13,542	52	4,333	17	18,831	72	4,307	17	2,858	11
Santo Tomas	Urban	5,615	175	3	3,768	67	397	7	4,340	77	807	14	468	8
	Rural	10,411	0	0	3,824	37	3,128	30	6,952	67	1,887	18	1,572	15
	Total	16,026	175	1	7,592	47	3,525	22	11,292	70	2,694	17	2,040	13
Tagum City (Capital)	Urban	17,439	5,236	30	10,593	61	627	4	16,456	94	591	3	392	2
	Rural	15,360	0	0	7,534	49	4,255	28	11,789	77	2,654	17	917	6
	Total	32,799	5,236	16	18,127	55	4,882	15	28,245	86	3,245	10	1,309	4
Talaingod	Urban	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	3,578	0	0	468	13	986	28	1,454	41	1,205	34	919	26
	Total	3,578	0	0	468	13	986	28	1,454	41	1,205	34	919	26
Provincial Total	Urban	42,457	6,558	15	26,855	63	1,965	5	35,378	83	4,475	11	2,604	6
	Rural	98,454	40	0	42,768	43	24,968	25	67,776	69	17,186	17	13,492	14
	Total	140,911	6,598	5	69,623	49	26,933	19	103,154	73	21,661	15	16,096	11



Table 4.2.2 Number of Student and School Toilet Facilities by Municipality

Name of Municipality		Number of School	Number of Student	Number of Toilets		
				Sanitary	Unsanitary	Total
Asuncion	Public	36	14,682	233		233
	Private	1	217	7		7
	Total	37	14,899	240		240
Braulio E. Dujali	Public	12	4,986	62		62
	Private	1	115	4		4
	Total	13	5,101	66		66
Carmen	Public	23	11,313	166		166
	Private					
	Total	23	11,313	166		166
Island Garden City of Samal	Public	59	18,841	184		184
	Private	4	1,079	25		25
	Total	63	19,920	209		209
Kapalong	Public	43	15,447	168		168
	Private	5	849	26		26
	Total	48	16,296	194		194
New Corella	Public	28	10,055	102		102
	Private	2	466	4		4
	Total	30	10,521	106		106
Panabo	Public	48	29,510	230		230
	Private	6	2,721	53		53
	Total	54	32,231	283		283
Santo Tomas	Public	30	18,835	123		123
	Private	7	1,314	28		28
	Total	37	20,149	151		151
Tagum City (Capital)	Public	37	37,874	371		371
	Private	13	4,290	73		73
	Total	50	42,164	444		444
Talaingod	Public	8	1,757	17	2	19
	Private					
	Total	8	1,757	17	2	19
<b>Provincial Total</b>	Public	324	163,300	1,656	2	1,658
	Private	39	11,051	220		220
	Total	363	174,351	1,876	2	1,878

Table 4.2.3 Number of Public Toilets Facilities in 1998

Name of Municipality	Public Markets			Bus/Jeepney Terminals			Parks/Playground			Total Number of Toilets
	No. of Sanitary Toilets	No. of Unsanitary Toilets	Sub-total	No. of Sanitary Toilets	No. of Unsanitary Toilets	Sub-total	No. of Sanitary Toilets	No. of Unsanitary Toilets	Sub-total	
Asuncion	1		1	1		1	2		2	4
Braulio E. Dujali							1		1	3
Carmen	1		1	1		2	5		5	11
Island Garden City of Samal	4		4	2			1		1	2
Kapalong	1		1				1		1	3
New Corella	1		1	1		1	1		1	4
Panabo	2		2	1		1	1		1	2
Santo Tomas	1		1				1		1	5
Tagum City (Capital)	2		2	2		2	1		1	1
Talaingod	1		1							
<b>Provincial Total</b>	<b>14</b>		<b>14</b>	<b>8</b>		<b>8</b>	<b>13</b>		<b>13</b>	<b>35</b>

5. EXISTING SECTOR ARRANGEMENT AND INSTITUTIONAL CAPACITY

5.5 Sector Agencies at the Local Level

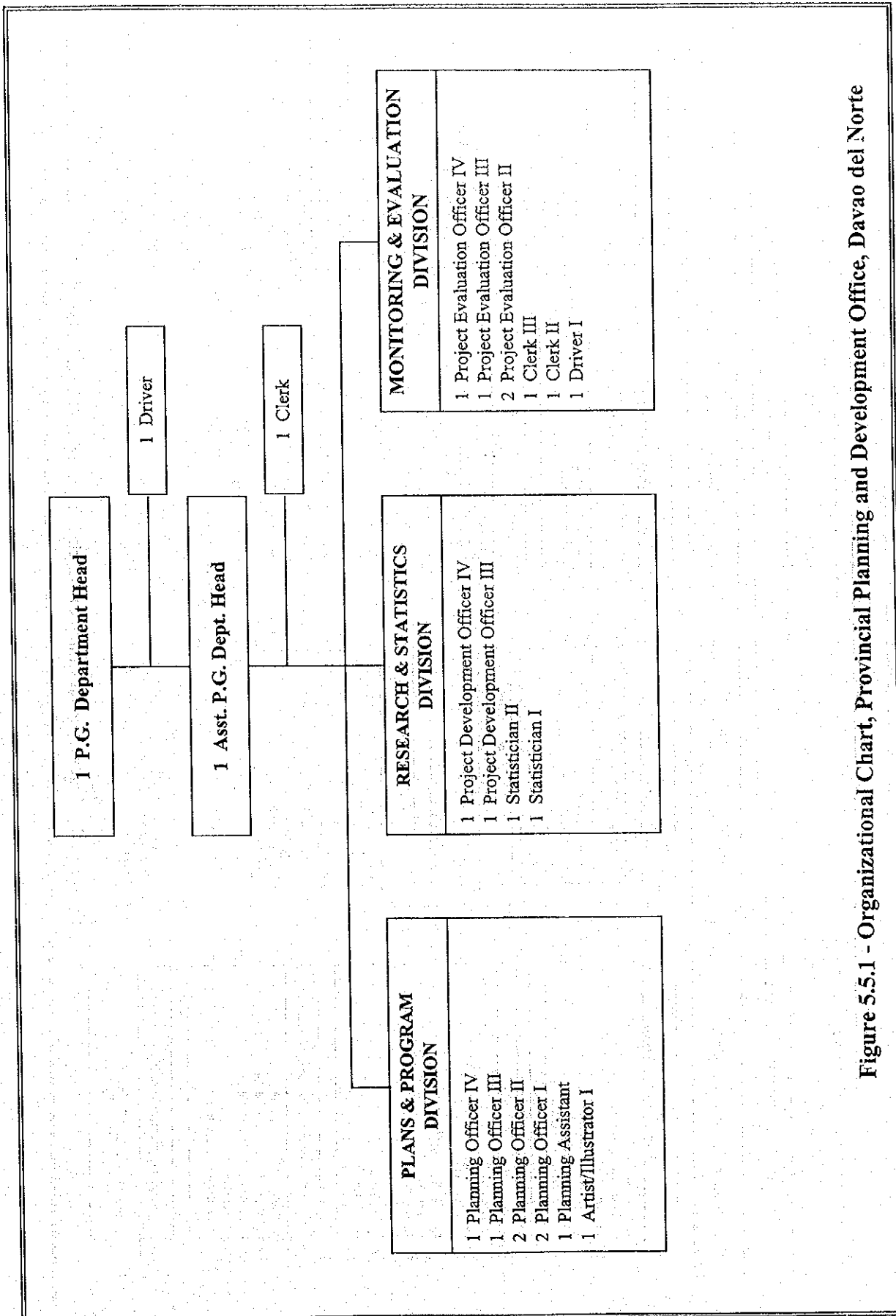
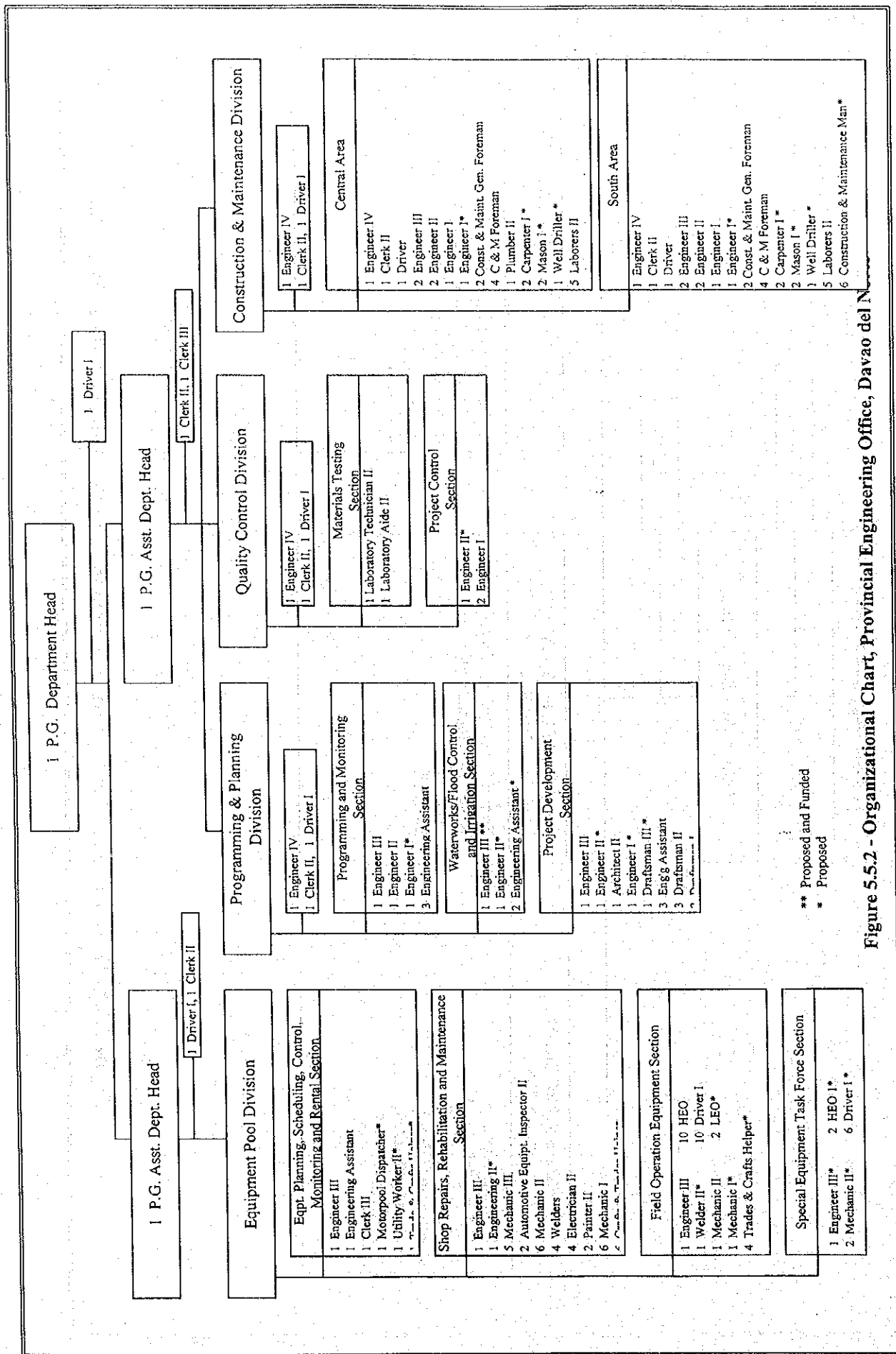


Figure 5.5.1 - Organizational Chart, Provincial Planning and Development Office, Davao del Norte



\*\* Proposed and Funded  
 \* Proposed

Figure 5.5.2 - Organizational Chart, Provincial Engineering Office, Davao del N.

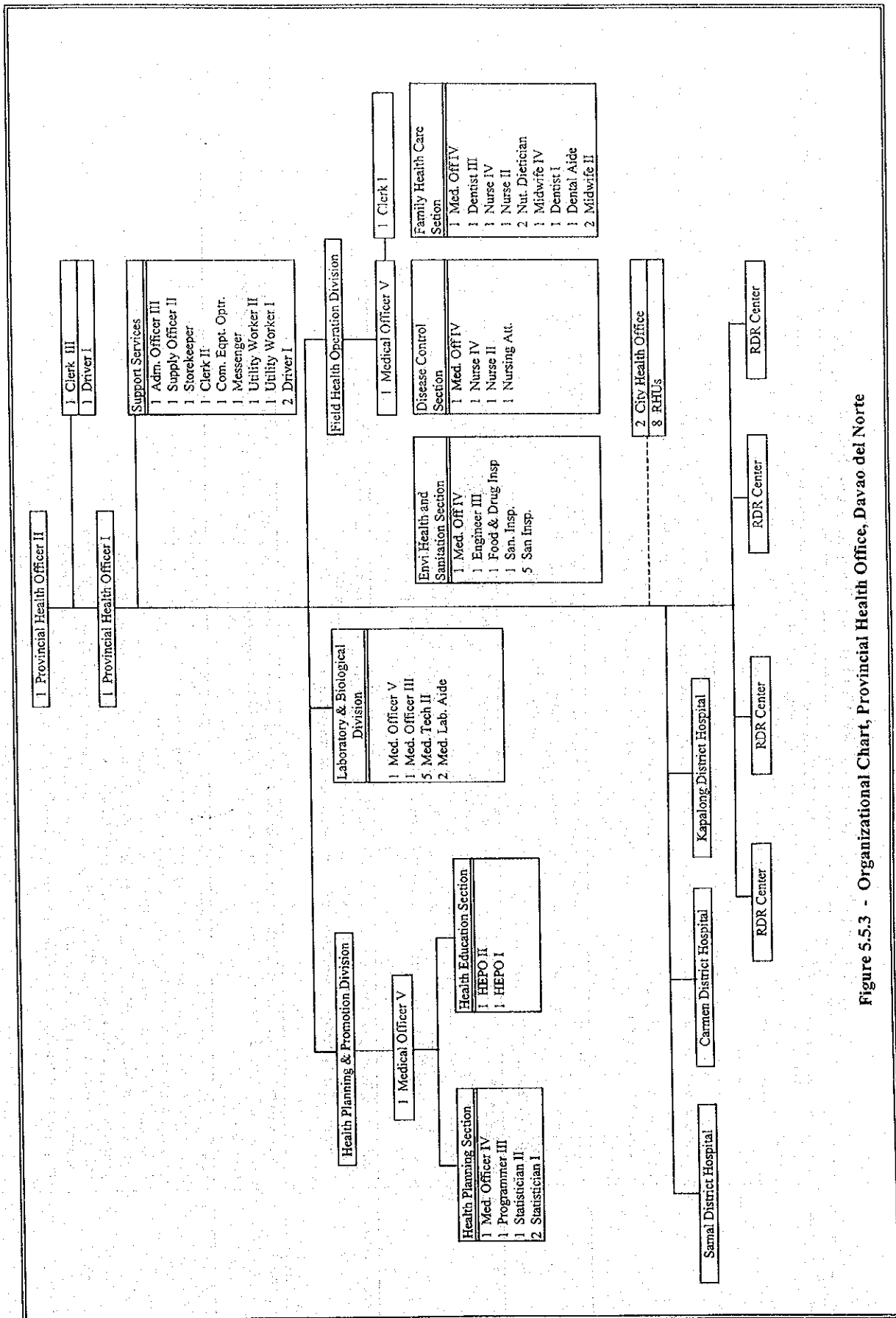


Figure 5.5.3 - Organizational Chart, Provincial Health Office, Davao del Norte

## 5.6 External Support Agencies in the Sector

Table 5.6.1 Priority Areas/Terms and Conditions, Programs and Projects by Donor

Donor	Priority Areas/Terms and Conditions	Programs and Projects in the Sector/Executing Agency
OECD	Providing project loans for <i>capital infrastructure (urban/rural), agricultural development, export promotion</i> . Can finance 75% of total project cost of total foreign exchange component, whichever is higher. Interest Rate: 2 to 3%; 30-year amortization with 10-year grace period. Environmental projects, interest free.	Water Supply and Sanitation Project-23rd Year Package/DILG; Co-financing AWSOP with World Bank and ADB/MWSS.
ADB	Providing both capital and technical assistance; Project loans: <i>agriculture, agri-industry, energy, social infra, transport and communications</i> ; Program Loans: sector loans (e.g., <i>forestry, livestock, environment</i> ). Can finance 60% of total project cost or 100% of foreign exchange cost whichever is higher. Special cases can finance up to 80% of total project cost. Terms: Interest rate- pool-based variable; commitment charge of 0.75% per annum; 25 years amortization period including 5-year grace period.	Rural Water Supply and Sanitation Sector Project/DPWH; Small Towns Water Supply Sector Project/LWUA; Technical Assistance for Water Supply and Sanitation Sector Study/NEDA; Co-financing AWSOP with World Bank and OECF/MWSS.
AUSAID	Providing grant aid for <i>education, training, development planning, resource management, environmental management, health/population, infrastructure (e.g. water supply, coal energy development), social infrastructure, community development and agriculture</i> . providing also supplies of commodities (steel cattle, drilling).	Water supply program in Central Visayas/RDCs and LGUs; Feasibility Study for Northern Mindanao Water and Sanitation Project.
DANIDA	Providing capital and technical assistance for <i>water supply and sanitation services and facilities, telecom ancillary equipment, small-scale power projects, environmental project, fishery and cold storage and post-harvest facilities</i> . Can finance up to 100% of foreign exchange goods and services of Danish origin, 10% local cost on a case-to-case basis. Technical assistance can be negotiated for conduct of feasibility studies if implementation of the project will require Danish financing in the future.	Water supply projects for 10 towns/LWUA; Feasibility Study for control of pollution in the Pasig River-Metro Manila; Water Supply and Sanitation Data Bank.
Government of France	Grants for feasibility studies and detailed design for projects in priority areas, e.g., <i>power generation, telecommunication, research involving high technology, water supply, air navigational equipment, etc.</i> Can finance 100% of foreign exchange costs of goods and services of French origin.	Feasibility Study for water supply project in Rizal province.
German Agency for Technical Cooperation (GTZ)	Providing grants for technical assistance. Promotion of <i>small and medium-scale industries, rural development, technical training, health/family planning, and environmental protection (forest management)</i> .	Water Supply for 20 Towns/LWUA; a national water supply and sanitation on-going program; special TA programs for cost recovery, monitoring and evaluation.
JICA	Providing a combination of capital assistance thru grant-aid and technical assistance thru Technical Cooperation for development survey and project type assistance which is a combination of experts, equipment and training. Technical assistance for <i>conduct of feasibility studies/master plans, provision of training, limited provision of equipment</i> . Capital assistance for <i>provision of equipment/materials for construction of hospitals, schools, research, social welfare centers</i> . Priority areas include <i>basic infrastructure, e.g., construction of facilities and supply of equipment; project development for sectors dealing with basic services (agriculture, health public welfare, environment) and human resource development (education, research, training)</i> . Can finance 100% of foreign exchange costs of civil works, equipment, training (in Japan) and of all goods and services of Japanese origin.	Groundwater study in Manila; Feasibility Study for Balara Water Treatment Plant Feasibility Study.

**Table 5.6.1 Priority Areas/Terms and Conditions, Programs and Projects by Donor**

Donor	Priority Areas/Terms and Conditions	Programs and Projects in the Sector/Executing Agency
UNDP	<p>Providing technical assistance for capacity building, human resource training, technology transfer, policy research, planning, technology development and pre-investment studies; Technical assistance are formulated within country program (CP) frameworks; 6th CP (1997-2001) - <i>poverty and sustainable livelihood, protection and regeneration of the environment and sound governance, gender equality</i></p> <p>Providing grant aids for technical assistance. Priority area: <i>social services, particularly for children.</i></p>	<p>WATSAN Program for LGUs and selected BWSAs/DILG.</p>
UNICEF	<p>Providing grant aid within its strategic objectives. Six strategic objectives and one special objectives are: <i>Accelerate the economic transformation of Mindanao; Improve national systems for trade and investment; Reduce population growth and improve maternal and child health; Enhance management of renewable national resources; reduce emissions of greenhouse gas; broaden participation in public formulation/implementation (selected areas); prevent rapid increase of HIV/AIDS.</i></p>	<p>Community-based water supply program in Palawan Province; Water supply and sanitation Study for Southern Mindanao.</p>
USAID	<p>Providing grant aid within its strategic objectives. Six strategic objectives and one special objectives are: <i>Accelerate the economic transformation of Mindanao; Improve national systems for trade and investment; Reduce population growth and improve maternal and child health; Enhance management of renewable national resources; reduce emissions of greenhouse gas; broaden participation in public formulation/implementation (selected areas); prevent rapid increase of HIV/AIDS.</i></p>	<p>Barangay Water Program (BWP) for communities with populations of less than 10,000. TA for private sector participation in the sector.</p>
World Bank	<p>Providing capital assistance in the form of under IBRD and IDA. IBRD (Project/Program) Loans: Interest rate = less than 7%, 20 years amortization with 5 years grace period; IDA Loans: interest free with 30 to 40-year amortization period. Providing also technical assistance in the form of ESW, IDP, Poverty and Human Resource Development Project Preparation and Policy Notes. Can finance 100% of foreign exchange costs of the project. Priority areas: <i>power and energy, roads, and railways, telecommunications, ports, water supply and sanitation, agriculture and social services.</i></p>	<p>AWSOP co-financed with ADB and OECF/MWSS; TA for a Water Supply Sector Program Study/DILG; TA on private sector participation in the water supply and sanitation sector; Water Districts Development Project.</p>

Table 5.7.1 Matrix of Current Practices and Issues from Rapid Assessment of Subject Provinces and Local Offices of Central Government Agencies

Areas	Institutional	Technical	Financial	Community Development
<p>1. Provincial Government Offices of Davao del Norte, South Cotabato, Sarangani, Misamis Oriental, and Bukidnon</p>	<ul style="list-style-type: none"> <li>Sector implementation is project-based arrangement by setting up a multi-agency team/task force. There is no overall mechanism and responsibility delineation among members wherein interrelationships/linkages are clearly shown.</li> <li>There is no current provincial plan for the sector except for the annual investment plan that serves as the basis for project funding and Local Development &amp; Investment Plan (LDIP) as a "Shopping List". As planning is budget centered, it focuses on the completion of facilities resulting to haphazard planning and poor/absence of maintenance of constructed facilities.</li> <li>Management is a process requiring input at every level. At the barangay level, facilities are supposed to be managed by the community. Management at higher levels is also necessary to effectively and efficiently implement a plan and requires administration abilities, and technical, negotiation, finance and economic skills. In all levels, management and skills are underdeveloped.</li> <li>Qualifications and experiences of the PSTF/PPDO staff are sometimes inadequate/inappropriate for their allotted responsibilities. This is important as the municipal government requires support from the provincial government.</li> <li>Training has been irregular and poorly organized. Course materials are complicated and provided a very</li> </ul>	<ul style="list-style-type: none"> <li>Project identification is usually upon the request of the barangay/municipal officials and approval is made by the Sanguniang Panlalawigan (SP).</li> <li>Most of constructions are by administration with procurement of materials done by the LGUs.</li> <li>Majority of the wells constructed by DPWH is abandoned/non-operational due to user's attitude, which suggest the need of community organization.</li> <li>O&amp;M is participated by barangay officials with LGUs providing technical and material supply assistance upon request.</li> <li>Dry-type sanitary toilet shall be considered in areas where water is not available.</li> <li>Water quality problems, such as coliform contamination, salt water intrusion, high iron and manganese content, etc. are often encountered especially in shallow wells resulting to abandonment of these wells.</li> <li>There is a shortage of equipment and supplies at all levels of administration. Technologies are sometimes inappropriate to local conditions (e.g., no readily available spares for pumps).</li> <li>More extensive data on groundwater resource is required to determine potential yields and chemical quality. Very limited drilling expertise/equipment.</li> <li>Proper O&amp;M is unlikely without significant training and equipment support at the barangay/association level</li> </ul>	<ul style="list-style-type: none"> <li>Income of the province comes from local taxes, IRA, national wealth share (3 provinces), and revenues from economic enterprises.</li> <li>Budgeting is guided by DILG circulars and approval is by the SP</li> <li>Budgetary allocation to the sector comes from 20% development fund capital expenditures for projects. However, the allocation by sector is lumped under general headings, so that allocation for WATSAN projects cannot be readily identified in the listing.</li> <li>Counterpart fund of LGUs for sector projects is usually for material purchase and the community is providing their labor. Sometimes, the provincial government allocates funds for WATSAN projects and the municipal government put up its counterpart fund provided by the province.</li> <li>Cost recovery mechanisms by LGUs and the users are not in place. BWSAs and RWSAs charge water fees for O&amp;M purposes only and do not consider capital costs. Rates are usually based on agreement among association members.</li> <li>Logistics and incentives for water associations are coursed through the barangays but are limited and most often subject to availability of funds.</li> <li>Most of the provinces have accessed development banks to finance infrastructure projects and purchase of equipment. Foreign assistance, e.g., CIDA, UNICEF, is availed through the Regional Development Council.</li> </ul>	<ul style="list-style-type: none"> <li>Limited involvement of local communities/end-users particularly in the planning and maintenance of facilities.</li> <li>Active involvement of religious NGOs as community organizers.</li> <li>No established arrangement on gender-responsiveness.</li> <li>There is little investigation of socio-cultural issues related to WATSAN; there is not enough commonsense understanding of the community it is working with. Little attention is given to or understanding of ethnic groups which is a serious constraint on sustainability.</li> <li>BWSAs formed by the DPWH-DEO are mostly not functioning now. A case of one BWSA, which was formed thrice, the first by the DEO, then the last two times by themselves is finally working and earning income from water fee collection. The failure for the first two times was due to low collection efficiency and money mismanagement.</li> <li>No formal system for community participation in site selection and project request; participation at the grassroots level is only considered if willingness from the beneficiaries is required for project request from the provincial government. Process is for barangay government to submit request to MDC/PDC, but no regular process for barangay to formulate projects from consultation and community participation.</li> <li>DILG's experimented with social</li> </ul>



Table 5.7.1 Matrix of Current Practices and Issues from Rapid Assessment of Subject Provinces and Local Offices of Central Government Agencies

Areas	Institutional	Technical	Financial	Community Development
	<p>wide range of topics that are difficult to absorb by the participants at one given time considering their background and experience.</p> <ul style="list-style-type: none"> <li>For monitoring and reporting, no arrangements are made to merge reports of line agencies/offices resulting in fragmentary information and difficulty of feedback. Lack of manpower to monitor.</li> <li>PHO provided training on water quality control/examination and sanitary toilet distribution.</li> </ul> <p><i>Countermeasures</i></p> <ul style="list-style-type: none"> <li>Coordinative mechanism drawn up in all implementing levels of the sector</li> <li>Establishment of a management information program/data base</li> <li>Improved planning and monitoring procedures</li> </ul>	<ul style="list-style-type: none"> <li>Toilets in schools are not used because there is no water.</li> </ul>	<ul style="list-style-type: none"> <li>IRA is not sufficient. 20% development fund is used for other sectors as well.</li> <li>LGU managed waterworks can directly source funds from the Land Bank for initial capitalization and operation. They can request funds from the Province, particularly the barangay based waterworks.</li> </ul>	<p>preparation by requiring beneficiaries to put up its equity contribution through certain amount of money or labor. Until now, the system is still functioning.</p> <ul style="list-style-type: none"> <li>In some BWSAs, the practice is to ban those who get water but are not paying.</li> <li>Participation of NGOs in the planning process is through their membership in the MDC/PDC.</li> </ul>
2. NEDA Regional Offices	<ul style="list-style-type: none"> <li>Communication between central and regional offices is deficient. Not all information on the on-going projects is reported to central office. Some multilateral assistance are directly extended to the regional offices under certain amount, such as funds from CIDA, UNICEF, Japanese government grass-root assistance. Only foreign assisted and national projects are reported regularly (quarterly reporting) by the regional office to NEDA central office.</li> <li>Regional office has just started and staffing is minimal compared to other regional offices causing difficulty in smooth implementation of the work. Plans to start computer-aided information control system. Project monitoring and evaluation system in regional level is a requisite including information on infrastructure status and investment.</li> <li>NEDA follows a general flow of reporting system within its organization. In spite of this, the central office has no complete or any information on region-specific projects.</li> </ul>			
3. DILG Regional Offices	<ul style="list-style-type: none"> <li>The DILG has field offices down to municipal level.</li> <li>Increasing responsibilities of the DILG as a result of devolution and decentralization of authority to the LGUs, would require greater logistic support, i.e., administrative support, not only technical support.</li> </ul>			
4. DPWH - DEO			<ul style="list-style-type: none"> <li>The DEO has no more budget for WATSAN activities because this has been devolved to the LGUs. However, the people still approach the office and request for financial help for its O&amp;M.</li> </ul>	

## 5.7.2 Institutional Aspect

**Table 5.7.2 Office/Agencies Involved in WATSAN Project**

Offices/Agencies	Nature of Involvement
Provincial Planning & Development Office	<ul style="list-style-type: none"> <li>• Incorporates in the provincial plans the WATSAN proposed projects</li> </ul>
Provincial Engineering Office	<ul style="list-style-type: none"> <li>• Assists in the construction, operation and maintenance of the WATSAN facilities</li> </ul>
Provincial Health Office	<ul style="list-style-type: none"> <li>• Conducts water quality examination</li> <li>• Provides toilet facilities</li> </ul>
Provincial Cooperative Development Office	<ul style="list-style-type: none"> <li>• Assists in the establishing cooperatives, including waterworks cooperatives</li> </ul>
DILG, Provincial Office	<ul style="list-style-type: none"> <li>• Conducts/assists training especially on topics related to human resource development</li> </ul>
Barangay/Municipal governments thru MPDO	<ul style="list-style-type: none"> <li>• Identifies projects</li> <li>• Provides counterpart support during implementation</li> </ul>
Water Districts	<ul style="list-style-type: none"> <li>• Provides water supply coverage in urban areas</li> </ul>
CIDA-PMO Regional Office	<ul style="list-style-type: none"> <li>• Provides technical and financial assistance through its Local Govt. Support Program</li> </ul>
Provincial General Services Office	<ul style="list-style-type: none"> <li>• Responsible in procurement of materials</li> </ul>
Provincial Accounting and Audit Office, Provincial Budget Office & Provincial Treasury Office	<ul style="list-style-type: none"> <li>• Responsible in financial releases</li> </ul>
NGOs	<ul style="list-style-type: none"> <li>• Provides consultancy services especially in CO/CD works</li> </ul>
Sangguniang Panlalawigan	<ul style="list-style-type: none"> <li>• Appropriates funds</li> </ul>

## **5.8 Community Development**

### **5.8.1 General**

#### **(1) RESULTS OF THE BARANGAY KEY INFORMANT SURVEY FOR DAVAO DEL NORTE**

##### **I. BARANGAY**

###### **A. General**

The barangay is the smallest political unit in the Philippines. A barangay captain who is elected for a three-year term heads it. Together with the barangay council, the barangay captain is responsible for running the affairs of the barangay. Water supply and sanitation sector projects are important to the barangay. Benefits are directly related to health and productivity, as well to improve economic activities in the community.

The key informant survey was conducted in three (3) barangays representing three (3) municipalities in Davao del Norte. The key informants were either an official of the barangay council, an official of the BWSA, or a recognized community leader. The purpose of the survey was to find out the degree and type of government assistance on the sector that cascades from the national government down to the barangay level. The barangays surveyed were: Magsaysay (Carmen); Datu Abdul (Panabo); and, Mambago-B (Island Garden City of Samal).

###### **B. Community Organization**

###### **1. Manner of Participation in Sector Development**

The need for water supply and sanitation facilities is discussed within and prioritized by the Barangay Development Council (BDC). If the barangay is not able to finance the WATSAN project from its own funds, the BDC then endorses the project to the municipality. Again, the prioritization and funding of the endorsed project are discussed in the Municipal Development Council (MDC). If the municipality can finance said project, then it does so, usually by providing technical and material support. The barangay is asked to contribute its share, which is usually in the form of free labor. If, however, the municipality cannot fund the barangays request, the project is once again endorsed, but this time to

the province. The project is then discussed/prioritized and provided funding by the provincial development council. If implemented by the province, a counterpart is asked of the barangay and sector participation is in the form of free labor and/or donations in cash or in kind.

**2. Existing Community Organization Serving /Acting as the Water Association**

The BWSA is still the WATSAN organization that provides water service in the barangays surveyed. None of the respondents was able to identify any community-based organization that could act as a water association, aside from the BWSA.

**3. Role of the Barangay Council in O&M Assistance in the Form of Funds/ Manpower/Materials**

All three barangay councils manifested willingness to facilitate, even pay, for the training of community members/volunteers on the operation and maintenance of the facilities.

**II. COMMUNITY PARTICIPATION**

**A. General**

The beneficiaries' participation is recognized as one of the determining factors in the success of the WATSAN sector plans on the community level. Participation by the barangay residents is measured by their willingness to organize themselves into a water association and contribute their share towards its operationalization. This may come in the form of free labor, donations in kind or in cash, or their active involvement in the management, operation and maintenance of the WATSAN facilities.

**B. Socio-Economic Conditions**

**1. Average Monthly Income in the Rural Area**

The average monthly income of the households in the barangays surveyed is P4,000.00. The list of economic activities shows the following: livestock, farming, vegetable gardening, and, sari-sari-store. The list shows both that both genders are equally involved in these economic activities.

## **2. Waterborne/Water Related Diseases**

Incidence of waterborne and water related diseases was reported in all the barangays surveyed. Most prevalent diseases are schistosomiasis, amoebiasis; dysentery, and dengue fever. This could be traced to lack of drainage facilities and garbage disposal systems in the areas.

## **C. Willingness to Participate**

### **1. Initiating the Organization of a WATSAN Association**

Each of the three barangays surveyed has a committee on water and sanitation within the barangay council. The respondents indicated that all the barangay councils are willing to participate in sector projects by initiating the formation of a water and sanitation association.

Half of the interviewees indicated that the barangay council is willing to pay for and/or facilitate the training for the user-beneficiary volunteers on O&M. In the area of health and sanitation education, almost all also believed that the barangay council has the capability to implement information dissemination activities.

## **D. Status of BWSAs/NGOs/CBOs/POs**

### **1. Number of Barangay with Functional BWSAs**

Two out of three barangays surveyed have a BWSA organized in their communities. Both BWSAs are still functional.

### **2. Status of NGOs/CBOs/POs**

Majority of the informants reported having NGOs/CBOs that do work in their communities. The areas of concern are in women's and veteran' welfare, health and sanitation, cooperative, financing, farm technology, environmental protection, and livelihood. Specifically related to sector needs is the Dona Luisa Foundation (headed by Dina Lumukso) which specializes in health and sanitation and in community development.

## **E. O&M Practices by Beneficiaries**

### **1. Facility Conditions**

Groundwater is widely used as source of water in the barangays surveyed. Water facilities that were constructed in the barangay were mostly shallow and deep wells. There is an area in Datu Abdul (Panabo, however, which depends on surface water. Almost all of the systems/facilities are still functional but occasionally have problems. All of the respondents indicated that the water is fit for drinking.

### **2. Common Difficulties and O&M Problems Encountered**

Common problems cited by the respondents range from defective pumps (no handle or rod, loose valves) to lack of funds for the maintenance work. The problems show that the users/beneficiaries still have the thinking that O&M is a task that belongs to others such as the barangay council or the municipality.

## **F. Water Charges Adopted and Collection Efficiency**

### **1. Sufficiency of Collected Charges for O&M**

Barangay residents pay fees for the use of the water facilities. Most people, according to the key informants, pay not more than P10.00 a month. A few residents pay more than P50.00 a month; while there are those who do not pay monthly dues but instead, are charged per container of water which they fetch, usually averaging P1.00 per three kerosene-can containers.

The majority of the respondents agreed that the fees being charged them are sufficient for the O&M of the WATSAN facilities.

### **2. Current Practices with Affordability by Users and Manner of Fee Collection**

The BWSA treasurer is responsible for collecting the fees in one barangay, the BWSA caretaker in another barangay, while in the barangay with no BWSA, it is either the purok chairman or anybody from the barangay who collects dues, usually contributions for the repair of malfunctioned system.

**G. Requests by the Beneficiaries on O&M of the Facilities from LGUs and other Sources**

**1. Government Subsidies Requested by End Users**

All barangays were recipients of technical assistance from the provincial and municipal government. Barangay Magsaysay was included in the Barangay Water Program and as such it was provided with small water systems. Barangay Datu Abdul was given some units of jetmatic pumps. Only Barangay Mambago, aside from receiving materials for the construction of concrete reservoirs, was given financial assistance to cover the labor cost of the construction.

**III. GENDER**

**A. General**

The survey results do not point to a severe lack of gender responsiveness to sector projects, but greater awareness on the important participation of both genders in WATSAN planning and implementation must be fully emphasized.

**B. Gender in the Composition of the Barangay Council**

In the three barangays surveyed, the members of barangay council total 24. Of this number, 22 were males and 2 females. All barangay captains are male.

**C. Gender in the Composition of the BWSA**

In the two BWSAs organized, about 75% of the members are male. There are no data on the composition of BWSA officers.

**D. Gender in Participation in the O&M of the Water Facilities**

Most of the key informants indicated that women actively participate in the O&M of the water facilities. Both male and female informants believed that women could be assigned as bookkeeper, to look after the cleanliness of the facility's surroundings, or to collect voluntary contribution.

**E. Gender in Knowledge or Awareness of Sector Related Information**

There is no gender bias when it came to awareness of sector related information. Both women and men were knowledgeable as seen from the answers to questions such as assistance extended by LGUs, facility conditions, and O&M practices.