

3. PROVINCIAL PROFILE
 3.3 Socio-economic Conditions
 3.3.2 Basic Infrastructure

Table 3.3.1 Number of Elementary School, High School and Other Served Facilities

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)												
Content: Socio-economic - Services											Page:	
Data Collection Level: Provincial											Date: 17 Dec. 1998	
Region Number: XI											Filename: Socio.xls	
Prov. Name: Davao del Norte											Form No.: P.1.5	
Geographic Code	Name of City or Municipality	Character	Elementary School			High School			Vocational Schools	Colleges and Universities	Hospitals/Clinics	Banks and Financing Institutions
			Public Number	Private Number	Total Number	Public Number	Private Number	Total Number				
			Number	Number	Number	Number	Number	Number				
112301	Asuncion		33		33	3	1	4			1	
	Braulio E. Dujali		9	1	10	3		3				
112303	Carmen		20		20	3		3			1	3
	Island Garden City of Samal		49		49	10	4	14	1	1	1	2
112305	Kapalong		37	3	40	6	2	8	1	1	4	1
112314	New Corella		25	1	26	3	1	4			1	1
112315	Panabo		42	3	45	6	3	9	5	4	11	5
112318	Santo Tomas		25	4	29	5	3	8	2	4	4	2
112319	Tagum City (Capital)		30	7	37	7	6	13	14	4	7	18
112322	Talaingod		7		7	1		1				

Source: PSPT, Davao del Norte, 1998

3.5 Health Status

3.5.1 Morbidity, Mortality and Infant Mortality

Table 3.5.1 Morbidity, Mortality and Infant Mortality by Municipality

Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP)				Prov. Number: 1123			Page:					
Content: Health - Morbidity and Mortality				Prov. Name: Davao del Norte			Date: 17 Dec. 1995					
Data Collection Level: Provincial				Municipal Number:			Filename: Health.xls					
Region Number: XI				Municipal Name:			Form Number: P.3.1					
Cause Group Diseases of:	Disease No.	Name of Diseases (Group)	Water Related Diseases	Annual Incidence per 100,000 People								
				Morbidity			Mortality			Infant Mortality		
				Male	Female	Total	Male	Female	Total	Male	Female	Total
Infective and Parasitic (001-136)	A.01	2-4/ Typhoid/Paratyphoid	X			136						
	A.02	5-7/ Dysentery	X			539			2			1
	A.03	8-10/ Intestinal Parasites	X			914						
	A.04	11-13/ Diarrhea	X			3,202			44			12
	A.05	14-16/ Tuberculosis				454			174			3
	A.06	17-19/ Conjunctivitis	X			70						
	A.07	20-22/ Whooping Cough										
	A.08	23-25/ Throat/Ear/Nose				21						
	A.09	26-28/ Tetanus				5			2			
	A.10	29-31/ Septicemia				3			3			
	A.11	32-34/ Cholera	X			12			2			
	A.12	35-37/ Varicella, Chickenpox				268						
	A.13	38-40/ Measles				328			1			1
	A.14	41-43/ Dengue Fever	X			233			1			1
	A.15	44-46/ Viral Hepatitis	X			50			4			
	A.16	47-49/ Malaria	X			829			6			1
	A.17	50-52/ Schistosomiasis	X			58			5			
	A.18	53-55/ Filariasis	X			4						
	A.19	56-58/ Venereal Diseases				4						
	A.20	59-61/ Other Bacter./ Viral Dis.				25						
Neoplasms (140-239)	B.01	62-64/ Malignant Neoplasms				4						
	B.02	65-67/ Leukemia				6			3			
Endocrine, Nutritional & Metabolic (250-279)	C.01	68-70/ Diabetes Mellitus				23			16			
	C.02	71-73/ Nutritional Deficiencies				75			9			
	C.03	74-76/ Endocrine Disorder										
Blood & Blood Forming Organs (280-289)	D.01	77-79/ Anemias										
Mental Disorder (290-319)	E.01											
Nervous System & Sense Organs (320-389)	F.01	80-82/ Meningitis				8			8			4
	F.02	83-85/ Nervous System				164						
Circulatory Systems (390-459)	G.01	86-88/ Heart Diseases				259			124			2
	G.02	89-91/ Vascular Diseases				2,669						
Respiratory Systems (460-519)	H.01	92-94/ Bronchitis				2,344			7			6
	H.02	95-97/ Pneumonia				3,812			150			50
	H.03	98-100/ Influenza				3,830			2			
	H.04	101-103/ Obstructive Pulmonary				44			3			
	H.05	104-106/ ARI				636			1			
Digestive System (520-579)	I.01	107-109/ Appendicitis				4						
	I.02	110-112/ Gastroent. Colitis				24			15			9
	I.03	113-115/ Chronic Liver Disease				11			4			
	I.04	116-118/ Other Diges. Diseases				19			8			
Genito-Urinary System (580-629)	J.01	119-121/ Kidney/ Nephritis							8			
	J.02	122-124/ Urinary Infections				154			4			
Complication of Pregnancy & the Puerperium (630-676)	K.01	125-127/ Prematurity				26			31			
Skin & Subcutaneous Tissue (680-709)	L.01	128-130/ Skin Diseases	X			204						
	L.02	131-133/ Scabies	X			127						
Musculoskeletal & Connective Tissue (710-739)	M.01	134-136/ Arthrop., Rheumatism				15						
Congenital Anomalies (740-759)	N.01	137-139/ Congenital Anomalies				8			11			5
Certain Causes of Prenatal Morbidity & Mortality (760-779)	P.01	140-142/ Birth Trauma										
	P.02	143-145/ Birth Injuries & Difficult Labor										
	P.03	146-148/ Resp. Fetus/Newborn				16			1			
	P.04	149-151/ Other Prenatal Causes										
Symptoms & Ill-defined Condition (780-799)	Q.01	152-154/ Senility				28						
	Q.02	155-157/ Ill-Defined Condition				17						
Accidents, Poisoning & Violence (800-999)	R.01	158-160/ Burns				22			1			
	R.02	161-163/ Suffoc. Foreign Body										
	R.03	164-166/ Other Accidents				105			57			

Source: PSPT, Davao del Norte, 1998

3.6 Environmental Conditions

3.6.3 Solid Waste Disposal

Table 3.6.1 Solid Waste Collection and Disposal by Municipality

Geographic Code		Name of City or Municipality		With Municipal Service						Without Service			
				Number of Collection Trucks			Disposal			Number of Household by Manner of Disposal			
Number	Character	Open Dump Trucks	Closed Type Trucks	Total Units	Number of Households Served by Open Dump Site	Number of Households Served by Sanitary Landfill	Dumping (Land and Water)	Burying	Composting	Number		Number	
										Number	Number	Number	Number
112301	Asuncion	1		1	220		9,827	305		809			
	Braulio E. Dujali						2,934						
112303	Carmen	2		2	956		4,385	3,256		2,156			
	Island Garden City of Samal	3		3	1,132		7,990	4,966		1,908			
112305	Kapalong	1		1	500		4,804	3,866		3,747			
112314	New Corella	1		1	152		3,035	1,790		3,409			
112315	Panabo	3		3	7,356		7,690	4,678		6,640			
112318	Santo Tomas	1		1	1,586		6,680	3,776		3,984			
112319	Tagum City (Capital)	2	4	6	16,113		10,350	3,651		2,685			
112322	Talaingod						3,578						

Source: PSPJ, Davao del Norte, 1998



- 4. EXISTING FACILITIES AND SERVICE COVERAGE
- 4.1 Water Supply
- 4.1.2 Types of Water Facilities and Definition of Service Level Standard

NEDA Board Resolution
No. 12 (s. 1995)

APPROVING THE COMMON
DEFINITION OF TERMS RELATIVE TO WATER
SUPPLY, SEWERAGE AND SANITATION

DEFINITION OF TERMS

Water Supply

Levels of Service

Three levels of water service shall be provided to urban and rural communities depending upon technical and financial considerations, the needs of the WDs and RWSAs, and their willingness and ability to share in the costs and the responsibility of constructing and maintaining the water systems. These are:

1. Level I (point source) - a protected well or a developed spring with an outlet but without a distribution system, generally adaptable for rural areas where the houses are thinly scattered. A Level I facility normally serves an average of 15 households.
2. Level II (communal faucet system or standposts) - a system composed of a source, a reservoir, a piped distribution network, and communal faucets. Usually one faucet serves 4 to 6 households. Generally suitable for rural and urban fringe areas where houses are clustered densely to justify a simple piped system.
3. Level III (waterworks system or individual house connections) - a system with a source, a reservoir, a piped distribution network and household taps. It is generally suited for densely populated urban areas.

Urban – the revised definition of urban population included the criteria on the economic and social functions of barrios, poblaciones and central districts resulting to the new definition which states:

1. In their entirety, all municipal jurisdictions which, whether designated as chartered cities, provincial capital or not, have a population density of at least 1,000 persons per square kilometers.
2. Poblaciones or central districts of municipalities and cities which have a population density of at least 500 persons per square kilometer.
3. Poblaciones or central districts (not included in nos. 1 and 2) regardless of population size which have the following:
 - a. Street pattern, i.e., network of streets in either at parallel or right angle orientation;
 - b. At least six establishments (commercial, manufacturing, recreational and/or personal services); and
 - c. At least three of the following:
 - i) a town hall, church or chapel with religious services at least once a month;
 - ii) a public plaza, park or cemetery;
 - iii) a market place or building on at least once a week and
 - iv) a public building like school, hospital, puericulture and health center or library.
4. Barrios having at least 1,000 inhabitants which meet the conditions set forth in no. 3 above, and in which the occupation of the inhabitants is predominantly non-farming/fishing.

Rural – all areas not falling under the urban classification (National Statistics Office).

Rural Waterworks and Sanitation Association (RWSAs) – non-stock, non-profit organizations envisioned to operate and manage Level II water supply facilities.

Barangay Waterworks and Sanitation Association (BWSA) – non-stock, non-profit organizations envisioned to operate and manage Level I water supply facilities.

Water Supply – for purpose of the plan, refers to the supply of the water for domestic, municipal, industrial/commercial uses.

Water Supply Coverage – refers to the number of people in a given community of geographical area who have access to safe water. The extent to which the population of a geographical area is covered (expressed in terms of the number of people served compared to the total population of that community or area).

Adequate Served – refers to those with the following rate or consumption:

Level I	at least 20 liters/capita/day
Level II	at least 60 liters/capita/day
Level III	at least 100 liters/capita/day

Service Coverage – the no. of people a facility can serve.

Level I Water Supply Systems

1. Deepwell – are characterized by aquifers or water bearing formations generally located at a depth of more than 20 (mbgs.). Construction of deepwells with depths greater than 20 meters are recommended in these areas.
2. Shallow Well – are areas suitable for construction of well with depths not more than 20 meters and are recommended for rural water supply development, particularly levels I and II services. Static water level in these areas are generally within 6 meters below ground surface.
3. Developed Springs – developed to capture the natural flow of an aquifer, pollution generally originates close to the point of capture. It is projected by: 1) excluding shallow seepage waters through encircling the spring with a watertight chamber penetrating a safe-distance into the aquifer and; 2) diverting surface run-off away from the immediate vicinity.
4. Protected Dug Wells – WASAMS defines protected dug wells as those which are adequately protected (guarded) against surface or outside contamination through the use of lining or covering, with a rim sufficiently raised above the ground level, and may be equipped with a pump (any type).

Salt Intrusion – encroachment of salt water upon fresh water.

Potable Water – water that is satisfactory for drinking, culinary and domestic purposes and meets the requirements of the health authority having jurisdiction. (Plumbing Code).

Population Underserved – population inadequately served.

Population Unserved – population without access to water supply facility.

Population Served – no. of population adequately served of connections x no. of persons served per connection.

Rainwater Cisterns/Collectors/Catchers – reservoirs, tanks or vessels for the storage of rainwater.

Reliable Water Supply – efficiency in the delivery of water supply in terms of quantity and quality.

Safe Drinking Water – water must be free of disease-producing bacteria (pathogens). In addition, the water should not possess undesirable tastes, odors, colors, turbidity or chemicals.

Service Area – geographic jurisdiction of water utilities.

Non-revenue Water – unbilled water.

Appropriate Technologies – suited to local conditions and resources.

Infiltration Galleries – horizontal wells which collect water over the entire length.

Accounted-for-water – billed water.

Access to Water Supply Facilities – access to water supply is categorized as follows:

Level I - the farthest user is not more than 250 meters from the point source.

Level II - the farthest house is not more than 25 meters from the communal faucet system.

Level III - the house have service connection from the system.

Private Water System – privately-owned water supply system.

Public Water System – system owned by the government.

DEFINITION OF TERMS

Sewerage and Sanitation

Sanitation – the development and practical application of sanitary measures for the sake of cleanliness and protecting health.

Sanitary Toilet – is an approved type of facility used for receiving and disposing human waste (feces and urine).

APPROVED TYPES

1. Flush – type of toilet facility with a mechanical device used to wash the waste into the receiving sewer or septic tank by the use of flushing water and with traps to provide a “water seal”.
2. Poor Flush – type of toilet facility without a mechanical device and in hand-flush with “water seal” connected to receiving sewer, septic tank or leaching pit.
3. Ventilated Improved Pit refers to an on-site toilet facility without using any amount of water comprising a vent pipe with a fly screen used to trap flies in a pit and, also allows evacuation of foul air into the atmosphere. This minimizes foul odor with the latrine superstructure and traps flies that could not spread diseases through faecal contamination.
4. Sanitary Pit Privy – type of toilet facility without using any amount of water, with a pit of at least 1-2 meters depth, a hole of one square meter, provided with a floor covering a riser, seat with cover which are all fly-and rodent proof and a building for privacy including the Antipolo type.

Unsanitary Toilet – a type of facility used for receiving and disposing human waste which does not fall under the category of approved types of toilet facilities.

UNAPPROVED/UNSANITARY TYPES

1. Open Pit Privy- a pit of at least the same dimension as the sanitary pit privy, provided with pit flooring, with or without riser and seat and without cover to protect from flies and rodents.
2. Overhang – a structure provided with flooring and with an opening built above the body of water or above the ground without pit under it, used for defecation of the disposal of human waste. It can be a part of the house or a separate structure outside the house.

LEVELS OF TOILET USE

1. Communal – a toilet facility shared by two or more households.
2. Public – toilet facility located at public places like markets, bus stations, etc. intended for public use.
3. School – a toilet facility located in a school.
4. Household – a toilet facility being used by an individual household.

Sewerage - facilities that collect human waste and sullage from residences and establishments usually piped and conveyed in structures (sewers, pump stations) for eventual central treatment and safe disposal. Piped sewerage includes a collection system (street laterals), a conveyance system (trunk sewers and pump stations), and a treatment plant/disposal system.

Human Waste – solid (feces) and liquid (urine) wastes from human.

Sullage – liquid wastes resulting from washing, bathing and laundry.

Drainage System – facilities that deal with rainwater.

Unsanitary Drainage System – facilities without treatment that deal with rainwater and also receive septic tank overflow and sullage. Includes open canals.

Without Toilet – households without any toilet but using body of water like rivers, lakes, etc. open field including coastal areas, and other mean to dispose human waste.

Access – availability of toilet facility within the household premises that can be used anytime.

On Site – the human waste is deposited and treated where the toilet facility is located.

Off Site – the human waste is transported for treatment.

4.2 Sanitation and Sewerage

4.2.3 Sanitation Facilities and Service Coverage

Table 4.2.1 Number of Household Toilets, by Type

Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP)																		
Content: Environment Sanitation - Household Toilet																		
Data Collection Level: Provincial																		
Region Number: XI																		
Prov. Number: 1123																		
Prov. Name: Davao del Norte																		
Form Number: P.6.1																		
Page:																		
Date: 08 Dec. 1998																		
Filename: Sanitation.xls																		
Form Number: P.6.1																		
Geographic Number	Name of City or Municipality	Number of Households Using Sanitary Toilets						Number of Households Using Unsanitary Toilets			Number of Households Without Toilets							
		Flush		Pour Flush		Sanitary Pit Latrine (VIP)		Total			Urban	Rural	Total	Urban	Rural	Total		
		Urban Number	Rural Number	Urban Number	Rural Number	Urban Number	Rural Number	Urban Number	Rural Number	Urban Number	Rural Number	Total Number	Urban Number	Rural Number	Total Number	Urban Number	Rural Number	Total Number
112301	Asuncion	3		1,206	7,145	90	245	1,299	7,390	23	974	997	98	1,377	1,475			
	Braulio E. Dujali			2,039	2,039	112	112	2,151	2,151		736	736		413	413			
112303	Carmen	53		768	4,462	169	1,754	990	6,216	552	1,614	2,166	150	1,231	1,381			
	Island Garden City of Samal	7	40	2,076	4,727	173	3,339	2,256	8,106	524	1,435	1,959	520	3,154	3,674			
112305	Kapalong	128		1,601	1,989	73	5,453	1,802	7,442	119	2,286	2,405	57	1,211	1,268			
112314	New Corella			1,165	2,716	59	1,740	1,224	4,456	331	1,616	1,947	19	740	759			
112315	Panabo	956		5,678	7,864	377	3,956	7,011	11,820	1,528	2,779	4,307	900	1,958	2,858			
112318	Santo Tomas	175		3,768	3,824	397	3,128	4,340	6,952	807	1,887	2,694	468	1,572	2,040			
112319	Tagum City (Capital)	5,236		10,593	7,534	627	4,255	16,456	11,789	591	2,654	3,245	392	917	1,309			
112322	Taiiangod				468		986		1,454		1,205	1,205		919	919			

Source: PSPT, Davao del Norte, 1998

Table 4.2.2 Number of School Toilets by Public and Private Classification

Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP)		Page:					
Content: Environment Sanitation - School and Student		Date: 08 Dec. 1998					
Data Collection Level: Provincial		Filename: Sanitation.xls					
Region Number: XI		Form Number: P.6.2					
Prov. Number: 1123							
Prov. Name: Davao del Norte							
Geographic Code	Name of City or Municipality	Number of School			Number of Student		
		Public Number	Private Number	Total Number	Public Number	Private Number	Total Number
112301	Asuncion	36	1	37	14,682	217	14,899
	Braulio E. Dujali	12	1	13	4,986	115	5,101
112303	Carmen	23		23	11,313		11,313
	Island Garden City of Samal	59	4	63	18,841	1,079	19,920
112305	Kapalong	43	5	48	15,447	849	16,296
112314	New Corella	28	2	30	10,055	466	10,521
112315	Panabo	48	6	54	29,510	2,721	32,231
112318	Santo Tomas	30	7	37	18,835	1,314	20,149
112319	Tagum City (Capital)	37	13	50	37,874	4,290	42,164
112322	Talaingod	8		8	1,757		1,757

Source: PSPT, Davao del Norte, 1998

Table 4.2.2 Number of School Toilets by Public and Private Classification (contd)

Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP)		Page:						
Content: Environment Sanitation - School Toilets		Date: 08 Dec. 1998						
Data Collection Level: Provincial		Prov. Number: 1123						
Region Number: XI		Prov. Name: Davao del Norte						
		Filename: Sanitation.xls						
		Form Number: P.6.3						
Geographic Code	Name of City or Municipality	Number of School Toilets						Total Unit
		Sanitary		Unsanitary		Total		
Number	Character	Public Number	Private Number	Public Number	Private Number	Public Number	Private Number	Number
112301	Asuncion	233	7	240				240
	Braulio E. Dujali	62	4	66				66
112303	Carmen	166		166				166
	Island Garden City of Samal	184	25	209				209
112305	Kapalong	168	26	194				194
112314	New Corella	102	4	106				106
112315	Panabo	230	53	283				283
112318	Santo Tomas	123	28	151				151
112319	Tagum City (Capital)	371	73	444				444
112322	Talaingod	17		17	2			19

Source: PSPT, Davao del Norte, 1998

Table 4.2.3 Number of Public Toilets by Type of Facility

Geographic Code		Name of City or Municipality	Number	Number of Toilets					
Region Number: XI		Character	Number	Sanitary		Unsanitary		Total	
Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP)				Male	Female	Male	Female	Male	Female
Content: Environment Sanitation - Public Toilets(Public Market)				Number	Number	Number	Number	Number	Number
Data Collection Level: Provincial									
Region Number: XI									
Prov. Number: 1123									
Prov. Name: Davao del Norte									
Form Number: P.6.4.1									
Filename: Sanitation.xls									
Date: 08 Dec. 1998									
Page:									
112301	Asuncion		2	1	1			1	1
	Braulio E. Dujali								
112303	Carmen		1	1	1			1	1
	Island Garden City of Sa		6	4	4			4	4
112305	Kapalong		1	1	1			1	1
112314	New Corella		2	1	1			1	1
112315	Panabo		2	2	2			2	2
112318	Santo Tomas		1	1	1			1	1
112319	Tagum City (Capital)		1	2	2			2	2
112322	Talaingod		1	1	1			1	1

Source: PSPT, Davao del Norte, 1998

Table 4.2.3 Number of Public Toilets by Type of Facility (contd)

Geographic Code		Name of City or Municipality	Number	Jeepney/Bus Terminal					
		Character	Number	Sanitary		Unsanitary		Total	
Number			Number	Male Number	Female Number	Male Number	Female Number	Male Number	Female Number
112301	Asuncion		2	1	1			1	1
	Braulio E. Dujali								
112303	Carmen		1	1	1			1	1
	Island Garden City of Sar		2	2	2			2	2
112305	Kapalong		1						
112314	New Corella		1	1	1			1	1
112315	Panabo		2	1	1			1	1
112318	Santo Tomas		1						
112319	Tagum City (Capital)		2	2	2			2	2
112322	Talaingod								

Source: PSPT, Davao del Norte, 1998

Table 4.2.3 Number of Public Toilets by Type of Facility (contd)

Geographic Code		Name of City or Municipality	Number	Number of Toilets				Total	
Character			Number	Sanitary		Unsanitary		Male	Female
				Male	Female	Male	Female	Number	Number
112301	Asuncion		1	2	2			2	2
	Braulio E. Dujali		1						
112303	Carmen		1	1	1			1	1
	Island Garden City of Sa		3	5	5			5	5
112305	Kapalong		1	1	1			1	1
112314	New Corella		1	1	1			1	1
112315	Panabo		1	1	1			1	1
112318	Santo Tomas		1	1	1			1	1
112319	Tagum City (Capital)		1	1	1			1	1
112322	Talaingod								

Source: PSPT, Davao del Norte, 1998

5. EXISTING SECTOR ARRANGEMENT AND INSTITUTIONAL CAPACITY

5.2 Sector Reforms

A. IMPLEMENTING RULES AND REGULATIONS

IMPLEMENTING RULES AND REGULATIONS OF NEDA BOARD RESOLUTION NO.4 (SERIES OF 1994), CLAUSE (G)

PREFACE

The following Implementing Rules and Regulations (IRR) of Clause (g) of NEDA Board Resolution No. 4 (series of 1994) was prepared with assistance from the World Bank, upon request of the Philippine Government, through the Department of the Interior and Local Government (DILG). It is an update of the earlier draft prepared in August 1995 and incorporates the developments that have occurred in the sector since that time. The intention is to provide a comprehensive and consistent set of IRR that reflects evolving policies in the sector to address basic service deficits. In particular, it attempts to translate the global sectoral principles of managing water as an economic goods and managing services at the most appropriate level, into rules and regulations that can be understood and implemented by the local government units. This IRR reflects the following policies currently being developed by the Government:

- a. Encouraging LWUA lending rates to local water districts to be aligned to market rates;
- b. Providing national government grants for source development of Level I systems in support of a national objective of poverty alleviation;
- c. Developing a national sector plan that will provide the basis for provinces and cities/municipalities to plan and implement water and sanitation investments based on what communities want and are willing to pay for;
- d. Instituting a framework for economic regulation of the water supply and sanitation sector and defining the role of the LGU in this framework; and
- e. Instituting a system of public performance audit of public and private water utilities, so that consumer feedback on service coverage and reliability is available at the national and local levels of Government.

A major development was the creation of the Presidential Task Force on Water Resources Development and Management in October 1996, which has the objective of streamlining the regulatory environment of the sector, that is, linking resource regulation with the economic regulation aspects. A proposed bill prepared by the Task Force has been filed with Congress in July 1997 for the creation of a Water Resources Authority of the Philippines (WRAP) to undertake these regulatory functions, among others. Once this is approved by Congress and passed into law, the IRR may have to be revised to reflect the major institutional changes, particularly with regard to the roles of national government agencies in the sector.

RULE 1

PURPOSE AND OBJECTIVES

Article 1. Title. These rules shall be known as the Implementing Rules and Regulations of clause (g) of NEDA Board Resolution No. 4, (series of 1994).

Article 2. Purpose. The purpose of these rules and regulations is to implement clause (g) of NEDA Board Resolution No. 4, (series of 1994), and is in support of NEDA Board Resolution No. 6, (series of 1996) which defines the executing agency arrangement for devolved infrastructure activities/facilities, including water supply, where national government assistance is provided. Clause (g) of NEDA Board Resolution No. 4 (series of 1994) states that:

"Level I (point source system), Level II (communal faucet) and Level III (house connections water supply projects may be implemented by the concerned LGUs within their jurisdiction. LWUA shall implement only financially viable Level III water supply projects in areas outside the MWSS jurisdiction. DILG's participation will consist of general administration and institution building, such as assistance to LGUs in the formation of Rural and/or Barangay Waterworks and Sanitation Associations (RWSAs/BWSAs) as well as in the identification of water supply systems. MWSS will be responsible for Level III water systems in Metro Manila and adjacent areas. DPWH, together with DILG and DOH, will provide technical assistance (within a period of about two years) to LGUs in the planning, implementation, and operation and maintenance of water supply facilities."

Annex C presents NEDA Board Resolution No. 6, (series of 1996).

Article 3. Objectives. The objectives of the Implementing Rules and Regulations are as follows:

- a. To define the role of local government units (LGUs) in the provision of water supply services and the assistance to be made available to them by national government agencies concerned;

- b. To provide guidance to the LGUs in the development and implementation of viable and sustainable water supply projects, to the extent feasible, supporting the principles espoused by the sector of managing water as an economic good, promoting a demand-oriented approach in the provision of services and management to be made at the most appropriate level, and greater private sector participation in service delivery; and
- c. To identify institutional strengthening needs of LGUs to further develop their capacity to adequately perform their agreed functions in the sector.

RULE 2

SCOPE

Article 4. Scope. These Implementing Rules and Regulations shall apply to water supply projects to be implemented and managed by LGUs where national government assistance is provided.

RULE 3

DEFINITION OF TERMS

Article 5. Definition of Terms. For purpose of these Implementing Rules and Regulations, the following terms shall be construed to mean as follows:

- a. **Levels of Service.** Based on NEDA Board Resolution No. 12 (series of 1995), approving the common definition of terms relative to water supply, sewerage and on-site sanitation, levels of service are defined as follows:

Level I (Point Source) – a protected well or a developed spring with an outlet but without a distribution system; generally adaptable for rural areas where the houses are thinly scattered. A Level I facility normally serves an average of 15 households.

Level II (Communal Faucet System or Standposts) – a system composed of a source, a reservoir, a piped distribution network, and communal faucets. Usually, one faucet serves four to six households. It is generally suited for rural and urban fringe areas where houses are clustered densely to justify a simple piped system.

Level III (Waterworks System or Individual House Connections) – a system with a source, a reservoir, a piped distribution network and household taps. It is generally suited for densely populated urban areas.

- b. **A financially viable water supply system** refers to a system wherein its revenues can cover for all costs related to capital and operation and maintenance, including providing for reasonable reserves for future expansion. For those systems managed by water districts, a financially viable system is one that is able to generate revenues directly from user payments sufficient to cover all costs¹. For LGU-managed directly systems, capital and operations and maintenance costs shall be recovered through a combination of user fees, general municipal taxes and other incomes available to the LGUs.

RULE 4

ROLE OF LOCAL GOVERNMENT UNITS

Article 6. General. The Local Government Code of 1991 mandates the decentralization and devolution of authority to LGUs in providing for certain basic services, which include safe potable water. At the local level, the LGUs are responsible for providing reliable water supply to their constituents, whether these are in the form of Levels I, II or III systems, depending on the expressed demand by the community for these services. LGUs may both directly provide and finance these services, or involve the private sector to participate in both provision and financing through concession, management or service contracts.

Article 7. Financing and Cost Recovery. In financing water supply investments, the LGUs may tap their Internal Revenue Allotment and/or locally generated revenues, or leverage these resources to borrow from government and private financial institutions. The amount that an LGU can borrow, including the required equity, is dependent on its current and expected revenue performance, as well as the amount of user charges and equity contributions from the community. The amount shall be a local decision of the LGUs concerned.

For any national government grant that may be provided for the development of Level I systems, the LGU and beneficiaries, concerned shall be required to provide any remaining amount as equity to the

¹ The Department of Finance is considering aligning the LWUA lending rates to local water districts toward market rates to allow for a more efficient use of scarce resources, as well as to provide for consistent policy on lending to LGUs by government financial institutions.

investment. No subsidies from the national government shall be provided for Levels II and III systems.²

In providing for Level III service, the LGUs may opt to form a water district or an LGU company, provide a franchise to a private party or participate in a joint venture with a private party. Except in areas with water districts, LGUs shall maintain overall responsibility for ensuring consumer satisfaction through the exercise of institutional and/or contractual regulatory powers over local water utilities³, in collaboration with other national regulatory agencies, and by instituting a system of public performance audit.

Cost recovery through user payments shall be encouraged for both capital and operation and maintenance costs. However, at the minimum, user payments shall be required to cover the operation and maintenance costs in all services levels. For LGU- owned, operated and/or guaranteed systems, any shortfall in revenues required for loan repayment shall be financed by the LGU from its Internal Revenue Allotment and/or locally-generated revenues, following a process of negotiation between the LGU and the beneficiaries concerned on the level of user payments.

For systems managed by local water districts, full cost recovery, through user charges, is required by LWUA.

In areas where there are existing local water districts, LGUs may finance rehabilitation works and/or expansion of the existing waterworks system on the following conditions:

- a. The local water district concerned is not in LWUA's current program of assistance, that is, it is not included in any loan of LWUA with a financing institution, and
- b. Endorsement by the local water district concerned should have been secured.

In the event that the local water district is servicing a loan from LWUA, the local water district shall seek clearance from LWUA prior to entering into an agreement with the LGU concerned on any program of system expansion.

² This policy has been approved by the Investment Coordination Committee of the NEDA Board.

³ As per Presidential Decree No. 198 (Provincial Water Utilities Act), LWUA regulates the technical standards and the tariffs of local water districts, based on its requirement to issue a certificate of conformance on every loan disbursed to the latter. Source regulation is done by the National Water Resources Board. At the moment, there is no recourse by the LGU in case of non-performance by the local water district. This is an issue that needs to be addressed by Government.

Article 8. Management of Systems. LGUs shall adopt commercial principles in the operation and management of water utilities in order to provide cost-effective and reliable services to consumers, whether management of the system is a direct responsibility of the LGU or is contracted out by the LGU to the private sector. An LGU may also consider amalgamating or consolidating its system with that of its neighboring LGUs in order to benefit from economies of scale that could expand water supply services to consumers at the lowest possible cost.

For the operation and management of Level I and II systems, the LGUs shall initiate the formation of Barangay and Rural Waterworks and Sanitation Associations (BWSAs/RWSAs), respectively, through a participatory approach involving consultation with all stakeholders (Article 20) and assist in their registration with the appropriate authorities (Article 21). Upon request, LGUs may accredit duly registered RWSAs/BWSAs in order to enable them to avail of financial assistance from local governments. LGUs shall have an overall supervision of RWSAs and BWSAs.

Article 9. Project Planning and Development. Provinces and cities/municipalities shall be required to prepare, and update on an annual basis, provincial and city/municipal sector plans that are consistent with a national sector plan⁴. These sector plans shall be integrated into the local investment programs. Water supply projects shall be identified from the local investment program, a financing program of foreign and nationally/locally-generated resources, including private sector resources, shall support the local investment program.

Article 10. Approval and Award of Contracts. The LGUs shall be required to conduct public bidding, in accordance with the provisions of Law, including Presidential Decree No. 1594, as amended, Executive Order No.302 and other applicable laws, and shall have the final authority to approve and award contracts for water supply and sanitation projects within their jurisdictions.

Article 11. Application for Water Rights. LGUs or the concerned water utility shall apply for water rights from the National Water Resources Board prior to implementing a project that would require extraction of water.

Article 12. Public Performance Audit. The LGUs shall establish a system of public performance audit for public and private water utilities focusing on critical performance indicators. Upon request of the LGUs, DILG may provide technical assistance for this purpose, in coordination with appropriate national government agencies.⁵

⁴ ADB is assisting the preparation of a National Sector Plan for Water Supply, Sewerage and Sanitation for 1999-2004

⁵ This system shall be pilot-tested in Metro Manila by the MWSS with World Bank financing.

RULE 5

ROLES OF NATIONAL GOVERNMENT AGENCIES

Article 13. Department of the Interior and Local Government (DILG). The DILG shall have the following responsibilities in the sector:

- a. Raise awareness of LGUs on opportunities relating to the sector, within the framework of relevant government policies, such as financing schemes and available assistance from local and foreign financing institutions, technological breakthroughs, management and institutional arrangements, etc.;
- b. Facilitate transactions between LGUs and communities and lending institutions by preparing water supply investment packages, assisting in the financial, economic and institutional and environmental data collection and analysis, etc., in coordination with appropriate national government agencies;
- c. Build capacity of LGUs and BWSAs/RWSAs in the general areas of planning, implementation, management, monitoring and evaluation, and regulation, upon agreement with the LGUs, and as required by financing institutions, in coordination with national government agencies such as DPWH in the case of the engineering aspects;
- d. Develop and maintain a national data management system of LGU-managed water systems to include data on extent of service coverage, cost recovery, collection efficiency, size of water systems, nature of water resources, among others, in coordination with appropriate national government agencies;
- e. Establish a system for monitoring strategic performance of LGUs in relation to the sector, including compliance with technical standards established by LWUA and DPWH;
- f. Upon agreement with the LGU, provide technical assistance in the establishment of a system of public performance audit, in collaboration with appropriate national government agencies;
- g. Coordinate sector activities of LGUs vis-a-vis other national government documents and issue regular bulletins;

- h. Monitor the implementation of this IRR, including the formulation of monitoring and evaluation parameters and reporting requirements; and
- i. Act as the coordinator for projects funded by the National Government per NEDA Board Resolution No. 6 (series of 1996).

Article 14. Local Water Utilities Administration (LWUA). The LWUA shall have the following responsibilities in the sector:

- a. Act as a specialized lending institution for local water districts;
- b. Provide technical assistance to local water districts in the areas of operation, maintenance, personnel training and fiscal practices;
- c. Upon agreement with the LGU, provide technical and financial assistance in the conduct of engineering studies;
- d. Approve tariffs of local water districts;
- e. Establish and update, as and when necessary, the technical standards for local water utilities, including LGU-managed systems;
- f. Monitor and evaluate the performance of local water districts; and
- g. Register RWSAs and furnish all registration documents to DILG.

Article 15. Department of Public Works and Highways (DPWH). The DPWH shall have the following responsibilities in the sector:

- a. Set and/or update, as and when necessary, technical standards for engineering surveys, design, construction and operation and maintenance of Level I systems;
- b. Upon agreement with the LGUs, assist in the conduct of engineering surveys and in the preparation of plans, specifications and programs of work, through its District Offices;
- c. Upon agreement with the LGUs, assist in construction management, through its District Offices; and

- d. Conduct technical researches in coordination with the LGUs.

Article 16. Department of Health (DOH). The DOH shall have the following responsibilities in the sector:

- a. Set and/or update, as and when necessary, standards on water quality testing, treatment and surveillance, and sanitary practices;
- b. Provide technical assistance to the LGUs in the conduct of periodic water quality control and surveillance-related activities; and
- c. Monitor and evaluate, on a regular basis, health and hygiene education programs implemented by local health offices, particularly in areas where waterworks systems are expected to be constructed.

Article 17. National Water Resources Board (NWRB). The NWRB shall have the following responsibilities in the sector:

- a. Regulate the use of water resources through the issuance of water rights;
- b. Regulate tariffs of privately-run water system; and
- c. Establish and manage a user-friendly water resources data management system.

Article 18. Metropolitan Waterworks and Sewerage System (MWSS). The MWSS shall be responsible for water systems in Metro Manila and its adjacent areas.

RULE 6

RURAL/BARANGAY WATERWORKS AND SANITATION ASSOCIATIONS

Article 19. General Provision. A Rural/Barangay Waterworks and Sanitation Association shall be formed to manage public water systems and sanitation facilities: RWSAs for Level II systems and BWSAs for Level I systems. RWSAs/BWSAs shall initiate/assist in site identification, planning, implementation and evaluation of water supply projects as well as guide the construction and/or maintenance of household and community latrines (toilets).

Article 20. Organization of RWSAs/BWSAs. RWSAs and BWSAs shall be organized upon initiation of the LGU. A participatory approach shall be adopted in the formation of RWSAs/BWSAs with the LGU concerned taking the lead and non-government organizations (NGOs) providing technical assistance, as necessary. Prior to the formation of RWSAs/BWSAs, dialogues shall be conducted with and among all stakeholders such as women's groups, civic and religious organization, health practitioners, NGOs and other people's organizations.

Article 21. Registration Requirements. RWSAs/BWSAs shall register with DILG. BWSAs shall be encouraged to associate with other BWSAs or the RWSAs prior to registration. DILG shall keep a record of all registration documents.

Article 22. Powers. Every duly registered RWSAs/BWSA shall be autonomous and shall have the power and capacity to:

- a. Award and enter into a contract(s) with private contractors for the delivery of necessary services or the supply of materials, in the course of managing a public water and sanitation facility, subject to existing laws, rules and regulations;
- b. Oversee the implementation of project undertaken by private contractors;
- c. Own and manage the operation of the water facility in a sustainable manner, including providing for adequate reserves for maintenance and repair, setting appropriate levels of user fees, and implementing billing and collection schemes;
- d. Handle the activities required of any lawful business transaction entered into by the Association;
- e. Enter into agreement with other RWSAs/BWSAs for any merger or consolidation as may be proven advantageous to their operations;
- f. Convene meetings of water users for the purpose of information dissemination, consultation, public hearing on water rates and other activities deemed important;
- g. Initiate improvements in operations found to be advantageous and favorable to the communities concerned;
- h. Decide on matters found to be advantageous and favorable to the communities concerned; and

- i. Prepare an annual report on its operations.

Article 23. Capability Building of RWSAs/BWSAs. RWSAs and BWSAs may request assistance for capability building from LGUs and/or DILG, DPWH and other concerned agencies, through the LGUs.

RULE 7

PROJECT DEVELOPMENT AND IMPLEMENTATION

Article 24. Sector Planning. Planning and development of water supply investment shall be made within the framework of national policies, and shall implement specific targets in the provincial and city/municipal sector plans. These plans shall define the strategies, policies and approaches in sector development at different levels of government. A National Sector Plan for Water Supply, Sewerage and Sanitation shall be prepared, and updated, on a regular basis, by the National Economic and Development Authority (NEDA), in coordination with the concerned oversight water agencies, and shall provide the national policy framework. At the provincial level, the LGUs, through their respective Provincial Planning and Development Offices, shall prepare, and update, on an annual basis, the Provincial Water Supply, Sewerage and Sanitation Sector Plans. At the city/municipal level, a similar sector plan shall be prepared and updated, on an annual basis, by the LGUs, through their City/Municipal Planning and Development Offices. The respective Local Councils shall approve the provincial and city/municipal sector plans.

Article 25. Project Identification. On the basis of the provincial and city/municipal sector plans, water supply investments shall be identified and developed into a local investment program that includes an appropriate financing plan. The Local Council concerned shall approve the local investment program. The proposed investments shall then be developed according to a demand-driven approach that would allow beneficiaries to select from among cost-effective technical options and from among financing options. The LGUs may avail of technical assistance from the DILG in the preparation of these project packages (Rule 5).

Water supply investment shall be developed to the principles of managing water services at the most appropriate level and providing services based on what local consumers want and are willing to pay for. This means that LGU systems shall be constructed on the basis of choosing among technical options that are affordable through the financial resources made available by users, communities and LGUs. The process of determining demand for a particular service delivery shall be concluded through a negotiated agreement between the LGU, water utility and the users, on how the costs will be shared at the town, barangay and household levels.

Article 26. Technical Aspects. Technically feasible options shall be developed, particularly for a Level II service level. These options may include varying levels of operation (in terms of operating hours), which may have substantial implications on capital and operating and maintenance costs. In addition, the operation and management (O&M) cost of a technical option is strongly influenced by the management mode chosen by an LGU, economies of scale factors and the size of the service area. Thus, for any Level III service, at least two technical options shall be explored; those of an inter-LGU service delivery organization involving amalgamation of service areas and of singled LGU management systems. The former option shall be explored and developed further only upon agreement with the LGU concerned.

In the conduct of the engineering work (i.e., feasibility studies and detailed design), the LGUs may tap the services of the private sector, using their internal resources or may request the DILG, DPWH and/or LWUA for financial and/or technical assistance.

Article 27. Financing and Management Options. A range of options is available to the LGUs on financing and management of Level III systems. They include, but are not limited to, the following options:

Options 1: The LGU may finance the system from its internal resources or may borrow from a financial institution. It may then create a **profit center within the LGU office** with a separate cost accounting system. Under this arrangement, the LGU may directly manage the system or may enter into a **management contract** with a private party or a **service contract** with a private party to handle billing and collection and/or repair and maintenance. In these types of management arrangements, the LGU retains the responsibility for providing the service and assumes the commercial risks. Institutions such as neighboring water districts, cooperatives and other private institutions may be tapped by the LGU for these types of contracts.

Option 2: The LGU may enter into a **lease contract** with private party to operate and manage the system. Under this arrangement, the LGU finances the capital expenditures from its internal resources or from borrowings. The LGU then leases the facility to a private party, which assumes the commercial risks and the responsibility for operation and maintenance. The private party is allowed to recover its costs from user fees, and may also collect, on behalf of the LGU, any other charges contributing to the repayment of a loan which the LGU may have taken on behalf of the users.

Option 3: The LGU may enter into **concession contract** with a private party. Under this arrangement, the private party assumes the operations and management of the assets of the LGU, and

undertakes to expand and finance the services according to the terms and conditions of the contract. The private party is then allowed to operate the system, and recover its costs and earn a reasonable return on its investment from user fees. The private party also assumes the commercial risk. After the concession contract expires, the system reverts to the LGU, or may be contracted out again by the LGU.

Option 4: The LGU may create a **local water district**, in accordance with Presidential Decree No. 198, as amended.

Option 5: The LGU may **form a water company** to handle the provision of the service.

The LGU appoints the Board of Directors to be tapped from the private sector who would manage the company along commercial principles.

Options 6: The LGU may enter into contract with a private party under the **Build-Operate-Transfer scheme or any of its variants**, per Republic Act No. 6970, as amended, for the whole water system or a component of it (i.e., source development or distribution).

Option 7: The LGU may enter into a **joint venture agreement** with a private party in providing the service. Under this arrangement, both parties share in the risks of the project, as well as operate the water supply system through a shared management and organization structure.

In the contracts of LGUs with private parties, performance standards shall be stipulated including remedies for non-performance that are consistent with national regulatory laws.

The DILG, in its role of raising awareness of LGUs on opportunities in the sector, shall be responsible for informing the LGUs of these schemes, and in facilitating the implementation of the preferred option. **Annex D** provides a matrix of these various schemes.

RULE 8

COORDINATION AND COLLABORATION MECHANISMS

Article 28. Inter-LGU Collaboration. Provinces, cities, municipalities and barangays may assist, coordinate and collaborate with each other, as far as practicable, in the effort of improving the delivery of services to the Filipino people. The DILG shall take the lead in coordinating among the LGUs.

Article 29. Coordination Between Local and National Governments. LGUs may avail of the technical, financial and institutional expertise of national agencies like LWUA, DPWH, DILG, NWRB, DOH and DENR. DILG, as appropriate, shall coordinate with other national agencies on behalf of the LGUs.

RULE 9

TRANSITION ARRANGEMENTS

Article 30. Ongoing Projects. The DPWH, DOH and DILG shall continue to implement ongoing foreign-assisted Level I projects until the completion of such projects.

Article 31. Pipeline Projects. Projects in the pipeline shall conform to the provisions of this IRR to the extent possible.

RULE 10

MISCELLANEOUS PROVISIONS

Article 32. Applicability Clause. The application of this IRR shall be without prejudice to existing and future laws, rules, regulations, and/or international agreements entered into by the Philippine Government.

Article 33. Effectivity of the IRR. These Implementing Rules and Regulations shall take effect upon its approval by the NEDA Board, on recommendation by the Infrastructure Committee. It shall then be published in at least two national newspapers of general circulation.

Annex A

NEDA Board Resolution No. 5 (series of 1998)

**APPROVING THE IRR ON THE DELINEATION OF
RESPONSIBILITIES IN THE DEVELOPMENT AND
IMPLEMENTATION OF WATER
SUPPLY PROJECTS**

On motion duly seconded,

BE IT RESOLVED, as it is hereby resolved, to approve as it is hereby approved, the Implementing Rules and Regulations (IRR) on the Delineation of Responsibilities in the Development and Implementation of Water Supply Projects.

UNANIMOUSLY APPROVED, 17 March 1998.

NEDA Board Resolution No. 4 (series of 1994)

APPROVING THE RECOMMENDATION OF THE
INFRASTRUCTURE
COMMITTEE (INFRACOM) ON THE REFORMS IN THE WATER
SUPPLY SECTOR

On motion duly seconded,

BE ITS RESOLVED, as it is hereby resolved, to approve and confirm, as the same is hereby approved and confirmed the following recommendations of the INFRACOM:

- a. Registration with the National Water Resources Board (NWRB) of all drilling and the extraction of water therefrom, irrespective of the use of extracted water and ownership of the land where the well is to be drilled. Amendment to Article 6 of the Water Code (PD No. 1067) shall be initiated by NWRB to this effect. Subsequently, NWRB shall formulate rules and regulations for the effective enforcement of these requirements within sixty (60) days after approval of the proposed amendment.
- b. Strengthening of the NWRB staff in order to effectively cope with the planning, monitoring and implementation activities of the water resources sector. NWRB shall submit an action plan to this effect to INFRACOM for review and endorsement to the President of the NEDA Board.
- c. Reorientation of the Local Water Utilities Administration (LWUA) to its original corporate mission as a "specialized lending institution" financing only viable water supply projects with tariff levels formulated towards full cost recovery. LWUA shall therefore upgrade its banking and finance expertise and immediately complete its financial restructuring. Further, it should radically improve its collection efficiency as well as its database and accounting systems.
- d. Privatization of all existing Water Districts (WDs) should be vigorously pursued whenever feasible and large commercially viable water services areas like Metro Manila, Cebu, Zamboanga, Davao should be formed or converted into SEC-style private water corporations, independent of LWUA and other government funding institutions by subject to regulation by NWRB.

- e. Procurement needs of WDs should be provided based on a competitive basis and not centrally imposed.
- f. LWUA shall submit an action plan to INFRACOM to effect the recommended reforms for review and endorsement.
- g. With respect to the delimitation of responsibilities in the sector, NEDA Board Resolution No. 5 (series of 1998) is proposed to be amended to allow local government units (LGUs) to implement all levels of water supply projects consistent with government's decentralization and devolution process, mandating LWUA to implement only financially viable projects and further defining the roles of the agencies in the sector. The proposed amendment is as follows:

"Level I (point source system), Level II (communal faucet) and Level III (house connections?) water supply projects may be implemented by the concerned LGUs within their jurisdiction. LWUA shall implement only financially viable Level III water supply projects in areas outside the MWSS jurisdiction. DILG's participation will consist of general administration and institution building, such as assistance to the LGUs in the formation of Rural and/or Barangay Waterworks and Sanitation Associations (RWSAs/BWSAs) as well as in the identification of water supply systems. MWSS will be responsible for Level II water systems in Metro Manila and adjacent areas. DPWH, together with DILG and DOH, will provide technical assistance (within a period of about 2 years) to LGUs in the planning, implementation and operation and maintenance of water supply facilities".

UNANIMOUSLY APPROVED, 15 March 1994.

NEDA Board Resolution No. 6 (series of 1996)

**APPROVING THE RECOMMENDATIONS OF THE
INFRASTRUCTURE COMMITTEE (INFRACOM) ON THE
EXECUTING AGENCY ARRANGEMENT FOR THE DEVOLVED
INFRASTRUCTURE ACTIVITIES/FACILITIES**

On motion duly seconded,

BE IT RESOLVED as it is hereby resolved, to approve and confirm as the same is hereby approved and confirmed, the following recommendations of INFRACOM on national government (NG) assistance to Local Government Units (LGUs) in the implementation of devolved infrastructure activities/facilities under the Local Government Code in support of national priority programs in order to ensure efficiency, effectivity and more focused implementation consistent with the Government's decentralization and devolution objectives:

- a. DILG, which has administrative supervision over LGUs, shall be the lead national government agency (NGA) to oversee/administer NG assistance to LGUs in the implementation of devolved infrastructure programs/projects with the collaboration/participation of other concerned agencies. The identification and formulation of infrastructure programs/projects devolved to LGUs proposed for NG assistance shall therefore be coordinated with DILG to rationalize their development;
- b. The implementation of identified devolved infrastructure programs/projects shall be undertaken by the LGUs with DILG providing assistance in institution, capacity and capability building of the LGUs and with DPWH and other technical agencies providing and transferring technical expertise to the LGUs as necessary. The levels of capacities and capabilities of LGUs shall be determined by the DILG in coordination and collaboration with DPWH and other concerned agencies to determine, among others, the extent of support and assistance that these national agencies should provide in order to effect the successful implementation of devolved NG-assisted infrastructure programs/projects:
- c. DILG, as the lead agency, shall include in its annual budget the financial requirements necessary for the implementation of the identified and approved devolved infrastructure programs/projects. This shall be without prejudice to any future funds arrangement that the national government may

adopt with regard to NG assistance to LGUs for devolved projects particularly funds source from foreign loans and grants;

- d. For on-going and already committed devolved infrastructure programs/projects with NG assistance, the same shall be implemented with the previously identified NGA as lead in order not to disrupt its prosecution. However, there shall be phasing in at DILG and LGUs in the implementation arrangements for these devolved infrastructure projects in accordance with the provisions of this Resolution for purposes of policy and operational consistency and thus, effect a smooth transition;
- e. To efficiency and effectively implement the provisions of this Resolution, the INFRACOM shall formulate and periodically review the guidelines, rules and regulations that will already define the specific roles of the various concerned agencies in the implementation of NG assistance to LGUs for devolved infrastructure activities/utilities as well as the appropriate implementing mechanisms. In addition, INFRACOM shall likewise formulate the criteria and program for phasing out NG assistance to LGUs for devolved infrastructure activities/facilities;
- f. To carry out its tasks, the INFRACOM may request for financial and technical assistance from participating government agencies as well as from multilateral and bilateral sources; and
- g. The provisions of this Resolution shall apply to all NG assistance for devolved infrastructure activities/utilities unless otherwise explicitly provided for under the existing and future laws, such as the General Appropriations Act (GAA).

UNANIMOUSLY APPROVED, 12 March 1996.

MATRIX OF FINANCING AND MANAGEMENT OPTIONS

<u>Option</u>	<u>Description</u>
LGU-Financed and Managed	The LGU finances the investment from its income and other resources available to it (e.g., URA, locally-generated taxes, grants) or borrows from a financial institution. It then establishes a profit center within the LGU office with a separate cost accounting system. Under this arrangement, the LGU directly manages the operations of the system. The LGU assumes the commercial risk.
Service Contract	The LGU finances the investment and directly operates and manages the system. It enters into contract with a private party to undertake billing and collection and/or repair and maintenance activities for a fee. The LGU maintains a profit center within the LGU office and assumes the commercial risk.
Management Contract	The LGU finances the investment and enters into contract with a private party to manage the system. The private party collects the water tariffs set by the LGU, operates and manages the system and in turn, is paid a management fee by the LGU. The LGU maintains a profit center within the LGU office and assumes the commercial risk.
Lease Contract	The LGU finances the capital expenditures and leases the facility to the private sector. The private sector assumes the commercial risks and the responsibility for operation and maintenance. To recover its costs, the private party is allowed to collect user fees as well as any other charges on behalf of the LGU.
Concession Contract	The LGU enters into contract with a private party to undertake the investment. The private party assumes the assets of the LGU and undertakes to expand the services according to the terms and conditions of the contract. The private party is allowed to operate the system and to collect user fees to recover its costs and earn a reasonable return on its investment. After the contract expires, the system reverts to the LGU or may be contracted out again by the LGU.
Creation of a Local Water District	The LGU may create a local water district. The local water district finances the investment from a loan from the Local Water Utilities Administration (LWUA) and operates and manages the system. The local water district is then supervised by LWUA.
LGU Company	The LGU may form a water company to handle the provision of the service. The water company shall be duly

registered with the Securities and Exchange Commission (SEC) and shall have share holdings which can be sold to the private sector in the future. The LGU appoints the board members to be selected from the private sector who would then manage the company along commercial principles.

Build-Operate-Transfer or any of its variants (per RA 6970 as amended)

Under the BOT scheme, the private sector finances the investment, operates it for a certain period of time after which the asset is transferred to the LGU. The private party is allowed to collect user fees to recover its costs and earn a reasonable rate of return on its investment. The LGU and the BOT proponent negotiate on the risk sharing.

Joint Venture Agreement

Under a joint venture agreement, the LGU and the private party share in the risks of the project and operate the system through a shared management and organizational structure.

NEDA BOARD RESOLUTION

No. 5 (s. 1994)

**APPROVING THE RECOMMENDATION
OF THE INFRASTRUCTURE COMMITTEE
(INFRACOM) ON THE NATIONAL POLICY,
STRATEGY AND ACTION PLAN FOR
URBAN SEWERAGE (LIQUID WASTE)
AND SANITATION**

On motion duly seconded,

BE IT RESOLVED, as it hereby resolved to approve as the same is hereby approved and confirmed the following recommendations of the INFRACOM:

A. NATIONAL POLICY

1. Provision of improved sewerage/sanitation services in urban areas shall be considered a high priority.
2. On-site sanitation facilities for all urban households/establishments readily adaptable to further sewerage systems shall be required.
3. All new subdivisions/housing developments shall provide simplified or conventional sewerage system/sanitation facilities.
4. Conventional or low-cost sewerage for central business districts and for potentially high-income residential areas where economically and financially viable shall be provided.
5. Treatment of industrial as well as collected city/municipality wastewater to established standards set forth by the DENR prior to disposal into the drainage system shall be required.
6. Provision of services shall be based on consumer demand and willingness to pay.

B. NATIONAL STRATEGY

1. A sanitation/sewerage program and a Central Sanitation/Sewerage program Support Office (CPSO) to coordinate subsector activities at the national level and to assist LGUs to plan and manage sanitation/sewerage programs at the community level shall be established.

2. External sources of assistance shall be explored provided as may be appropriate to enable Municipal Development Fund (MDF) facility or other financing sources to extend loans to LGUs for sanitation and sewerage projects.
3. LGUs shall primarily be the implementors of the sanitation/sewerage programs with the national government providing assistance to develop their capacities in the following areas: community participation, sub-sector planning, program management, regulation of development, selection of technologies, financial management, construction supervision, O&M, monitoring and reporting.

C. ACTION PLAN

1. A CPSO shall be created and housed at LWUA with the LWUA Board exercising over-all jurisdiction over its operations. An Inter-departmental Advisory Committee (IAC) composed of representatives from DPWH, DOH, DILG, DOF, DBM, LWUA, DENR, MWSS and NEDA shall likewise be created and act as the coordination body in the implementation and monitoring of urban sewerage and sanitation programs particularly the five (5) pilot areas (Davao City, Calamba, Dagupan City, Roxas City and Cotabato City). The representatives to the IAC shall preferably be Asst. Sec. or Dir. level. The Chairman of the IAC and the Dir. of the CPSO shall be appointed by the LWUA Board.
2. LWUA shall fully staff the CPSO from within its existing manpower as soon as possible. An international institutional development consultant shall be engaged to assist the CPSO to design and implement the activities. The CPSO shall exist for a period of about 3 to 5 years or until after its functions have been fully devolved to the LGUs.

UNANIMOUSLY APPROVED, 15 March 1994.

Certified true copy:

FORTUNATO R. ABRENILLA
Acting Board Secretary
and Director, Legal Staff



7. WATER SOURCE DEVELOPMENT

7.1 General

Table 7.1.1 Well Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)					Page: 1 of 6
Content: Water Source - General Information				Date:	
Data Collection Level: Provincial		Province No.: 1123		Filename: Water Source.xls	
Region Number: XI		Province Name: Davao del Norte		Form Number: P.4.1	
	Type of Water Source		Shallow Well	Deep Well	Spring
Implementor	Total number of water sources	Number	8,335	1,452	157
	Government Agency	Number	830	620	138
	Private	Number	7,505	832	19
Level	Level I	Number	8,335	1,418	137
	Level II	Number		8	15
	Level III	Number		26	5
Ownership	Water District	Number		10	2
	MEO/CEO	Number			1
	RWSA	Number			1
	BWSA	Number			
	Institution	Number		24	16
	Commercial Establishment	Number			
	Industrial/Agricultural Undertaking	Number			
	Private (Domestic)	Number	830	620	137
Abstraction	Submersible/Turbine	Number		34	
	Centrifugal	Number			
	Handpump	Number	8,335	1,418	
	Bucket & Rope	Number			
	Free Flowing	Number			
Usage	Drinking	Number	1,667	1,452	157
	Washing/Bathing	Number			
	Gardening/Irrigation	Number			
	Big-Scale Irrigation	Number			
	Production	Number			
Water Quality	No Quality Problem	Number			
	High Iron/Mag. Content	Number			
	High Chloride Content	Number			
	Turbidity/Colored/Smell	Number			
	Polluted/Contaminated	Number			
	Chlorinated	Number			
	Treated	Number			
Production	Seasonal Production	Number			
	Average Capacity < 100 m ³ /day	Number	8,335	1,421	139
	Average Capacity >= 100 m ³ /day	Number		24	17
	Number of Household < 5	Number			
	Number of Household >= 5	Number			

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 2 of 6	
Content: Water Source - General Information						Date:		
Data Collection Level: Provincial			Province No.: 1123		Filename: Water Source.xls			
Region Number: XI			Province Name: Davao del Norte			Form Number: P.4.1		
	Name of Municipalities	Character	Asuncion			Braulio E. Dujali		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	242	149	27	143	6	
Implementor	Government Agency	Number	141	93	27	21		
	Private	Number	101	56		122	6	
Level	Level I	Number	242	145	27	143	6	
	Level II	Number		1				
	Level III	Number		3				
Ownership	Water District	Number						
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number		4				
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	141	93	27	21		
	Private (Domestic)	Number	101	52		122	6	
Abstraction	Submersible/Turbine	Number		4				
	Centrifugal	Number						
	Handpump	Number	242	145		143	6	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	48	149	27	29	6	
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m ³ /day	Number	242	146	27	143	6	
	Average Capacity >= 100 m ³ /day	Number		1				
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 3 of 6	
Content: Water Source - General Information						Date:		
Data Collection Level: Provincial			Province No.: 1123		Filename: Water Source.xls			
Region Number: XI			Province Name: Davao del Norte			Form Number: P.4.1		
	Name of Municipalities	Character	Carmen			Island Garden City		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	17	7		123	105	39
Implementor	Government Agency	Number	3			89	104	24
	Private	Number	14	7		34	1	15
Level	Level I	Number	17	2		123	104	24
	Level II	Number					1	13
	Level III	Number		5				2
Ownership	Water District	Number		2				
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number		3			1	15
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	3			89	104	24
Private (Domestic)	Number	14	2		34			
Abstraction	Submersible/Turbine	Number		5			1	
	Centrifugal	Number						
	Handpump	Number	17	2		123	104	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	3	7		25	105	39
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m ³ /day	Number	17	4		123	104	26
	Average Capacity >= 100 m ³ /day	Number		3			1	13
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)						Page: 4 of 6		
Content: Water Source - General Information						Date:		
Data Collection Level: Provincial			Province No.: 1123			Filename: Water Source.xls		
Region Number: XI			Province Name: Davao del Norte			Form Number: P.4.1		
	Name of Municipalities	Character	Kapalong			New Corella		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	394	506	15	80		33
Imple- mentor	Government Agency	Number	88	202	15	70		29
	Private	Number	306	304		10		4
Level	Level I	Number	394	505	15	80		29
	Level II	Number						1
	Level III	Number		1				3
Ownership	Water District	Number						2
	MEO/CEO	Number						
	RWSA	Number						1
	BWSA	Number						
	Institution	Number		1				1
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	88	202	15	70		29
Private (Domestic)	Number	306	303		10			
Abstraction	Submersible/Turbine	Number		1				
	Centrifugal	Number						
	Handpump	Number	394	505		80		
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	79	506	15	16		33
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m ³ /day	Number	394	505	15	80		29
	Average Capacity >= 100 m ³ /day	Number		1				3
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 5 of 6	
Content: Water Source - General Information						Date:		
Data Collection Level: Provincial			Province No.: 1123			Filename: Water Source.xls		
Region Number: XI			Province Name: Davao del Norte			Form Number: P.4.1		
	Name of Municipalities	Character	Panabo			Santo Tomas		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	4,679	465	20	2,290	88	3
Imple- mentor	Government Agency	Number	83	79	20	300	60	3
	Private	Number	4,596	386		1,990	28	
Level	Level I	Number	4,679	460	20	2,290	82	3
	Level II	Number		3			2	
	Level III	Number		2			4	
Ownership	Water District	Number		2				
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number		3			6	
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	83	79	20	300	60	3
Private (Domestic)	Number	4,596	381		1,990	22		
Abstraction	Submersible/Turbine	Number		5			6	
	Centrifugal	Number						
	Handpump	Number	4,679	460		2,290	82	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	936	465	20	458	88	3
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m ³ /day	Number	4,679	460	20	2,290	82	3
	Average Capacity >= 100 m ³ /day	Number		3			4	
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)						Page: 6 of 6		
Content: Water Source - General Information						Date:		
Data Collection Level: Provincial			Province No.: 1123			Filename: Water Source.xls		
Region Number: XI			Province Name: Davao del Norte			Form Number: P.4.1		
	Name of Municipalities	Character	Tagum			Talaingod		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	312	110	7	55	16	13
Imple- mentor	Government Agency	Number	11	72	7	24	10	13
	Private	Number	301	38		31	6	
Level:	Level I	Number	312	99	7	55	15	12
	Level II	Number					1	1
	Level III	Number		11				
Ownership	Water District	Number		6				
	MEO/CEO	Number						1
	RWSA	Number						
	BWSA	Number						
	Institution	Number		5			1	
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	11	72	7	24	10	12
Private (Domestic)	Number	301	27		31	5		
Abstraction	Submersible/Turbine	Number		11			1	
	Centrifugal	Number						
	Handpump	Number	312	99		55	15	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	62	110	7	11	16	13
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
Production	Treated	Number						
	Seasonal Production	Number						
	Average Capacity < 100 m ³ /day	Number	312	99	7	55	15	12
	Average Capacity >= 100 m ³ /day	Number		11				1
	Number of Household < 5	Number						
Number of Household >= 5	Number							

Table 7.1.2 Major References

Report/Information	Agency/Author	Contents	Reference Data/Description	Output
1. Topographic Map (1:250,000)	NAMRIA	political boundary, topographic contour, river, road, etc.	major river basins & road	Location Map (Base Map of the Province)
2. Rapid Assessment of Water Supply Sources	NWRB	groundwater availability, well inventory	well depth, static water level, specific capacity, etc.	Groundwater Availability Map
3. Individual Well Information Database	NWRB	location & well inventory	location with well depths & water levels	Individual Well Location Map
4. Groundwater Resources Investigation	NWRB	groundwater potential	high yielding and water quality problem areas	Groundwater Availability Map
5. Geological Map of the Philippines	BMGS	lithologic distribution and structures	aquifers distribution	Groundwater Availability Map
6. Philippine Water Resources Summary Data	NWRB	location map & runoff records	runoff record & statistical data	River Flow Duration Curve & Probability of Surface Water
7. Road Network Map of the Province	PPDC	major road & municipality boundaries	municipal boundaries	Distribution Map of Urban & Rural Areas
8. Feasibility Study Reports of the Water Districts	LWUA	well field information	groundwater potential & quality	Groundwater Availability Map
9. Water Quality Analysis Result	Water Districts	water quality results	water sources quality	Groundwater Availability Map & Groundwater Quality
10. Water Quality Analysis Result	PHO, PSPT	water quality results	water sources quality	Groundwater Availability Map & Water Sources Quality
11. Assessment of the Mineral Production	DENR	location, activity of the mining sites	location & activity of the mining sites	River Network Map
12. General Information of Groundwater	DEO, PSPT	groundwater availability	low yielding and water quality problem area	Groundwater Availability Map
13. Well Inventory	DEO, PSPT	location and well information	well depth, static water level, specific capacity, etc.	Existing Well Inventory
14. Spring Inventory	DEO, PSPT	location and spring information	discharge, distance & elevation	Water Sources Information
15. Pumping Test Data	DEO	pumping test results	well capacity	Groundwater Availability Map

7.3 Groundwater Sources

7.3.1 Classification of Groundwater Availability

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
ASUNCION	Binancian	Level I	SW	18.0	3.0	
ASUNCION	Buclad	Level I	SW	15.0	2.5	
ASUNCION	Buclad	Level I	DW	61.0	6.0	
ASUNCION	Cabaywa	Level I	SW	18.0	2.5	
ASUNCION	Cabaywa	Level I	DW	35.0	6.0	
ASUNCION	Camoning	Level I	SW	5.0	3.0	
ASUNCION	Camoning	Level I	DW	56.0	10.0	
ASUNCION	Canatan	Level I	SW	16.8	4.6	
ASUNCION	Concepcion	Level I	SW	20.0	2.5	
ASUNCION	Dona Andrea	Level I	SW	18.0	2.4	
ASUNCION	Igangon	Level I	SW	18.0	2.0	
ASUNCION	Kipalili	Level I	SW	15.0	3.0	
ASUNCION	Kipalili	Level I	DW	79.0	28.0	
ASUNCION	Magatos	Level I	SW	12.0	3.0	
ASUNCION	Magatos	Level III	DW	61.0	5.5	
ASUNCION	Mamangan	Level I	DW	48.0	8.0	
ASUNCION	Napungas	Level I	SW	18.0	3.0	
ASUNCION	New Bantayan	Level I	SW	18.0	2.5	
ASUNCION	New Santiago	Level I	SW	18.0	2.5	
ASUNCION	New Santiago	Level I	DW	48.0	3.0	
ASUNCION	Pamacaun	Level I	SW	18.0	3.0	
ASUNCION	Pamacaun	Level I	DW	61.0	8.0	
ASUNCION	Pob. Cambanogoy	Level I	SW	18.0	3.0	
ASUNCION	Pob. Cambanogoy	Level I	DW	61.0	9.0	
ASUNCION	Sagayen	Level I	SW	18.0	3.0	
ASUNCION	Sagayen	Level I	DW	40.0	8.0	
ASUNCION	San Vicente	Level I	SW	18.0	3.0	
ASUNCION	Santa Filomena	Level I	SW	18.0	3.0	
ASUNCION	Santo Nino	Level II	DW	54.0	9.0	
ASUNCION	Sawata	Level II	DW	85.0	27.0	
BRAULIO E. DUJALI	Cabay-Angan	Level I	SW	18.0	3.0	
BRAULIO E. DUJALI	Magupising	Level I	SW	18.0	3.0	
CARMEN	Cebulano	Level I	DW	58.0	6.0	
CARMEN	Magsaysay	Level III	DW	61.0	10.0	1.2
CARMEN	Tubod	Level III	DW	40.0	1.7	0.4
CARMEN	Tuganay	Level I	SW	18.0	6.0	
CARMEN	Tuganay	Level I	DW	48.0	6.0	
ISLAND GARDEN	Balet	Level I	DW	84.0	36.0	
ISLAND GARDEN	Caliclic	Level I	DW	84.0	81.0	
ISLAND GARDEN	Camudmud	Level I	DW	78.0	24.0	
ISLAND GARDEN	Cogon	Level I	DW	40.0	34.0	
ISLAND GARDEN	Coson (Talicod)	Level I	DW	90.0	54.0	
ISLAND GARDEN	Dadatan	Level I	DW	84.0	72.0	
ISLAND GARDEN	Del Monte	Level II	DW	61.0	42.0	
ISLAND GARDEN	Kanaan	Level I	DW	96.0	81.0	
ISLAND GARDEN	Kinawitnon	Level I	DW	86.0	75.0	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
ISLAND GARDEN	Libuak	Level I	DW	69.0	36.0	
ISLAND GARDEN	Linosutan	Level I	DW	90.0	81.0	
ISLAND GARDEN	Mambago-B	Level I	DW	80.0	34.0	
ISLAND GARDEN	Pob. Miranda	Level II	DW	39.0	21.0	0.3
ISLAND GARDEN	Pob. Moncado	Level I	DW	90.0	72.0	
ISLAND GARDEN	San Isidro	Level I	DW	72.0	54.0	
ISLAND GARDEN	San Miguel	Level I	DW	26.0	12.0	
ISLAND GARDEN	San Remigio	Level I	DW	78.0	56.0	
ISLAND GARDEN	Santa Cruz	Level I	DW	90.0	84.0	
ISLAND GARDEN	Santo Nino	Level I	DW	85.0	66.0	
ISLAND GARDEN	Tambo	Level I	DW	61.0	24.0	
KAPALONG	Capungagan	Level I	DW	21.0	5.0	
KAPALONG	Capungagan	Level I	DW	48.0	6.0	
KAPALONG	Florida	Level I	SW	19.0	12.0	
KAPALONG	Florida	Level I	DW	72.0	10.0	
KAPALONG	Gabuyan	Level III	DW	54.0	8.0	
KAPALONG	Gupitan	Level I	DW	21.0	5.5	
KAPALONG	Katipunan	Level I	SW	18.0	4.5	
KAPALONG	Katipunan	Level I	DW	48.0	7.0	
KAPALONG	Libuton	Level I	SW	18.0	6.0	
KAPALONG	Libuton	Level I	DW	55.0	20.0	
KAPALONG	Linao	Level I	DW	54.0	8.0	
KAPALONG	Luna	Level I	DW	54.0	8.0	
KAPALONG	Mabantao	Level I	DW	60.0	8.0	
KAPALONG	Mamacao	Level I	SW	19.0	6.0	
KAPALONG	Mamacao	Level I	DW	48.0	7.0	
KAPALONG	Pag-asa	Level I	DW	54.0	9.0	
KAPALONG	Pinamuno	Level I	SW	18.0	6.0	
KAPALONG	Pob. Maniki	Level III	DW	61.0	18.0	1.1
KAPALONG	Sampao	Level I	DW	54.0	8.5	
KAPALONG	Semong	Level I	SW	18.0	6.0	
KAPALONG	Semong	Level I	DW	72.0	8.0	
KAPALONG	Sua-on	Level I	DW	60.0	9.0	
KAPALONG	Tiburcia	Level I	SW	18.0	7.0	
NEW CORELLA	Carcor	Level I	SW	6.0	3.5	
NEW CORELLA	Dasing*	Level I	SW	7.0	5.0	
NEW CORELLA	Del Pilar	Level I	SW	20.0	2.0	
NEW CORELLA	El Salvador	Level I	SW	12.0	2.0	
NEW CORELLA	Limba-an	Level I	SW	15.0	3.5	
NEW CORELLA	Macgum	Level I	DW	36.0	6.0	
NEW CORELLA	New Bohol	Level I	SW	18.0	6.0	
NEW CORELLA	New Cortez	Level I	DW	21.0	6.0	
NEW CORELLA	New Sambog	Level I	DW	36.0	8.0	
NEW CORELLA	Poblacion	Level I	SW	12.0	3.0	
NEW CORELLA	San Jose	Level I	SW	7.0	2.5	
NEW CORELLA	San Roque	Level I	DW	21.0	4.5	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
NEW CORELLA	Santa Cruz	Level I	SW	7.0	2.5	
NEW CORELLA	Santo Nino	Level I	SW	7.0	3.5	
NEW CORELLA	Suawon	Level I	SW	6.0	3.5	
PANABO	Cagangohan	Level I	DW	24.0	5.0	
PANABO	Datu Abdul Dadia	Level I	DW	40.0	3.0	
PANABO	J.P. Laurel	Level I	SW	12.0	4.0	
PANABO	Kasilak	Level I	SW	18.0	3.0	
PANABO	Kauswagan	Level I	SW	15.0	3.0	
PANABO	Lower Panaga	Level I	DW	32.0	6.0	
PANABO	Mabunao	Level III	DW	97.0	60.0	0.1
PANABO	Malativas	Level I	DW	24.0	12.0	
PANABO	Manay	Level I	DW	60.0	8.0	
PANABO	Nanyo	Level I	SW	12.0	4.0	
PANABO	Nanyo	Level I	DW	48.0	6.0	
PANABO	Pob. San Francisco	Level I	SW	6.0	2.5	
PANABO	Pob. San Francisco	Level III	DW	70.0	4.0	4.7
PANABO	Pob. Santo Nino	Level I	SW	5.0	2.5	
PANABO	Quezon	Level I	SW	12.0	3.0	
PANABO	Quezon	Level I	DW	42.0	7.5	
PANABO	Salvacion	Level I	SW	8.0	8.5	
PANABO	Salvacion	Level I	DW	42.0	7.0	
PANABO	San Nicolas	Level I	SW	18.0	3.0	
PANABO	San Nicolas	Level I	DW	39.0	6.0	
PANABO	Santa Cruz	Level I	DW	60.0	24.0	
PANABO	Sindaton	Level III	DW	60.0	12.0	1.5
PANABO	Southern Davao	Level I	DW	48.0	9.0	
PANABO	Tagpore	Level I	DW	36.0	6.0	
PANABO	Tibungol	Level II	DW	32.0	6.0	
PANABO	Upper Licanan	Level I	DW	36.0	7.0	
PANABO	Waterfall	Level I	DW	32.0	9.0	
SANTO TOMAS	Balagunan	Level I	SW	18.0	4.0	
SANTO TOMAS	Balagunan	Level II	DW	79.3	7.7	0.5
SANTO TOMAS	Bobongon	Level I	SW	18.0	3.0	
SANTO TOMAS	Bobongon	Level II	DW	54.0	9.0	0.5
SANTO TOMAS	Casig-Ang	Level I	SW	15.0	4.0	
SANTO TOMAS	Esperanza	Level I	SW	20.0	3.0	
SANTO TOMAS	Kimamon	Level I	SW	12.0	3.0	
SANTO TOMAS	Kimamon	Level III	DW	47.0	6.5	
SANTO TOMAS	Kinamayan	Level I	SW	18.0	4.0	
SANTO TOMAS	La Libertad	Level I	SW	18.0	3.0	
SANTO TOMAS	Lungaog	Level I	SW	15.0	3.0	
SANTO TOMAS	Magwawa	Level I	SW	18.0	3.0	
SANTO TOMAS	New Katipunan	Level I	SW	10.0	3.0	
SANTO TOMAS	New Katipunan	Level I	DW	42.0	7.5	
SANTO TOMAS	New Visayas	Level I	DW	36.0	5.5	
SANTO TOMAS	Pantaron	Level I	SW	18.0	3.0	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
SANTO TOMAS	Pantaron	Level I	DW	48.0	6.0	
SANTO TOMAS	Pob. Tibal-og	Level I	SW	12.0	4.0	
SANTO TOMAS	Pob. Tibal-og	Level III	DW	67.0	3.0	2.8
SANTO TOMAS	Salvacion	Level I	DW	79.0	9.0	
SANTO TOMAS	San Jose	Level III	DW	54.0	9.0	0.3
SANTO TOMAS	San Miguel	Level I	DW	79.0	7.0	
SANTO TOMAS	San Vicente	Level I	DW	33.0	5.5	
SANTO TOMAS	Talomo	Level I	DW	41.0	7.0	
SANTO TOMAS	Tulalian**	Level I	SW	13.0	2.5	
SANTO TOMAS	Tulalian**	Level I	DW	42.0	7.5	
TAGUM	Apokon	Level I	SW	16.0	6.0	
TAGUM	Bincungan	Level I	DW	55.0	9.0	
TAGUM	Canocotan	Level I	DW	73.0	3.0	
TAGUM	Cuambogan	Level I	DW	61.0	5.0	
TAGUM	La Filipina	Level I	DW	180.0	5.0	
TAGUM	Madaum	Level III	DW	94.0	FF	
TAGUM	Magdum	Level I	DW	42.0	7.0	
TAGUM	Magugpo East	Level I	DW	49.0	1.5	
TAGUM	Mankilam	Level I	DW	70.0	36.0	
TAGUM	Nueva Fuerza	Level I	DW	54.0	9.0	
TAGUM	Pagsabangan	Level I	DW	61.0	8.0	
TAGUM	Pandapan	Level I	DW	48.0	6.0	
TAGUM	Pob. Magugpo	Level III	DW	118.0	15.3	
TAGUM	San Agustin	Level I	DW	57.0	9.0	
TAGUM	San Isidro	Level III	DW	48.0	10.0	
TAGUM	San Miguel	Level I	SW	5.0	3.0	
TAGUM	San Miguel	Level III	DW	48.0	7.0	
TAGUM	Visayan Village	Level III	DW	54.8	9.0	
TALAINGOD	Dagohoy	Level I	SW	15.0	5.0	
TALAINGOD	Dagohoy	Level I	DW	54.0	9.0	
TALAINGOD	Palma Gil	Level I	DW	40.0	8.0	

7.3.3 Groundwater Quality

Table 7.3.2 Groundwater Quality

No.	Municipality	Type	Bacterio.		Physical Analysis				Chemical Analysis				Major Cations				Major Anions				Trace Ele.		
			Coili. Cnt.	Bact. Cnt.	T	NTU	TCU	Odor	TDS mg/l	EC mmpc	pH	TH mg/l	Alka. mg/l	Acid. mg/l	Na mg/l	K mg/l	Ca mg/l	Mg mg/l	CO3 mg/l	HCO3 mg/l	Cl mg/l	SO4 mg/l	Fe mg/l
	Philippine National Standard for Drinking Water -1994-		0	0	-	>	unobj.	500>	-	6.5 to 8.5	-	-	-	-	200>	-	-	-	-	200>	250>	1>	0.5>
1	Asuncion	DW	-	-	0	29	-	-	-	7.3	-	-	-	-	-	-	-	-	-	-	-	0.0	0.3
2	Asuncion	DW	-	-	4	53	-	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	0.4	0.1
3	Braulio E. Dujali	SW	-	-	0	34	-	-	-	6.9	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2
4	Island Garden	DW	0	50	20	-	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	0.4	0.1
5	Island Garden	DW	0	10	10	-	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1
6	Island Garden	SW	0	50	1	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1
7	Island Garden	SW	100	100	8	-	-	-	-	6.9	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1
8	Island Garden	SW	30	50	8	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1
9	Kapalong	DW	-	-	0	60	-	-	-	8.2	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3
10	Kapalong	SW	-	-	2	52	-	-	-	8.1	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3
11	New Collera	DW	0	10	1	-	-	-	-	7.8	-	-	-	-	-	-	-	-	-	-	-	0.4	0.2
12	New Collera	DW	0	30	1	-	-	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	0.1	0.0
13	New Collera	DW	0	0	1	-	-	-	-	7.5	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0
14	New Collera	SP	0	TNTC	0	-	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0
15	New Collera	SW	0	30	1	-	-	-	-	7.7	-	-	-	-	-	-	-	-	-	-	-	0.3	0.1
16	Panabo	DW	10	50	14	202	-	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	0.4	0.3
17	Panabo	SW	10	30	4	135	-	-	-	7.5	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3
18	Panabo	SW	-	-	19	-	-	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	0.3	0.2
19	Santo Tomas	SW	-	-	0	84	-	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1
20	Talaingod	DW	-	-	4	9	-	-	-	6.7	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3
21	Talaingod	SP	-	-	0	39	-	-	-	7.5	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0
22	Talaingod	SP	-	-	0	13	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0
23	Talaingod	SW	-	-	2	81	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3

Source: Water quality results were collected from respective Water Districts or analyzed by PSPT on site in the field survey using procured instruments. Notes: Sampling point is located at handpump (L-I) or submersible pump (L-II/III).

Table 7.5.1 Surface Water Quality

Major Surface Water	Surface Water Information		Parameter														PNSDW -1994				Surface Water Pollutants in upstream
	Stream & Main Systems	Sampling Location	Date (m/d/y)	Color TCU	pH	D.Oxy. mg/l	BOD mg/l	SS mg/l	TDS mg/l	MBAS mg/l	O/G mg/l	N mg/l	P mg/l	Coli. MPN/100ml	Cl mg/l	Cu mg/l	Tur. NTU	Fe mg/l	Mn mg/l		
DENR Water Quality Criteria for Fresh Water																					
			Class AA	15	6.5-8.5	70	1	25	500	nil	nil	1	nil	50	250	1	5>	1>	0.5>		
			Class A	50	6.5-8.5	70	5	50	1,000	0.2	1	10	0.1	1,000	250	1					
Hijo		Tagum		124.0	8.4	-	-	-	-	-	-	-	-	-	-	-	128	0.4	0.3	Mining	
Tagum	Limbaan	New Corella		7.0	7.9	-	-	-	-	-	-	-	-	-	-	-	2	0.4	0.0		
	Saug	Asuncion		82.0	8.0	-	-	-	-	-	-	-	-	-	-	-	35	0.4	0.3	Mining	
	Salao	Tagum																			
		Talaingod																			
		Kapalong		111.0	8.5	-	-	-	-	-	-	-	-	-	-	-	68	0.4	0.2		
		Sto. Tomas		122.0													193	0.4	0.3		
		Braulio E. Dujali																			
		Carmen																			
	Main	Talaingod																			
		Kapalong																			
		Asuncion																			
		Sto. Tomas																			
		Braulio E. Dujali																			
		Tagum		113.0	8.3	-	-	-	-	-	-	-	-	-	-	-	132	0.4	0.3		
		Carmen																			
		Talaingod																			
Lasang		Panabo		56.0	8.5	-	-	-	-	-	-	-	-	-	-	-	23	0.3	0.2		

Source; Water quality results were collected from respective Water Districts or analyzed by PSPT on site in the field survey using procured instruments.

Notes; Sampling point is located at upstream boundary of each river in respective municipalities.

If several streams are present in an area, the stream nearest from populated area was selected.

If there is no upstream, sampling point was selected near populated area.

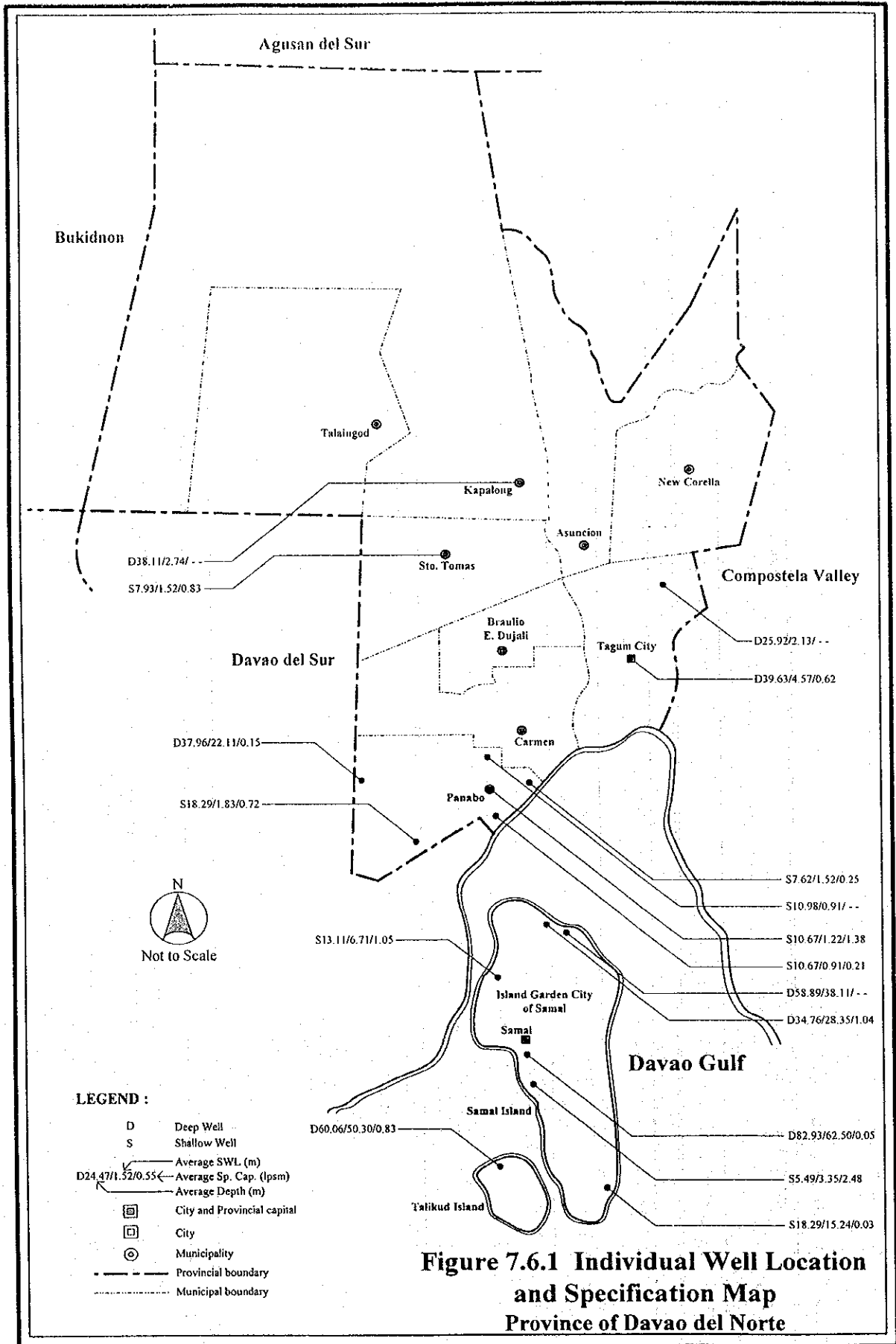
Remarks Class AA - Public Water Supply Class-I.

Intended for waters having watersheds which are uninhabited and otherwise protected and which require only approved disinfection in order to meet the PNSDW.

Class A - Public Water Supply Class-II.

Sources of water supply that will require complete treatment (coagulation, sedimentation, filtration & disinfection) in order to meet the PNSDW.

7.6 Future Development Potential of Water Sources







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