5. EXISTING SECTOR ARRANGEMENT AND INSTITUTIONAL CAPACITY

5.5 Sector Agencies at the Local Level

Figure 5.5.1 Organization Chart, Provincial Planning and Development Office of Agusan del Norte

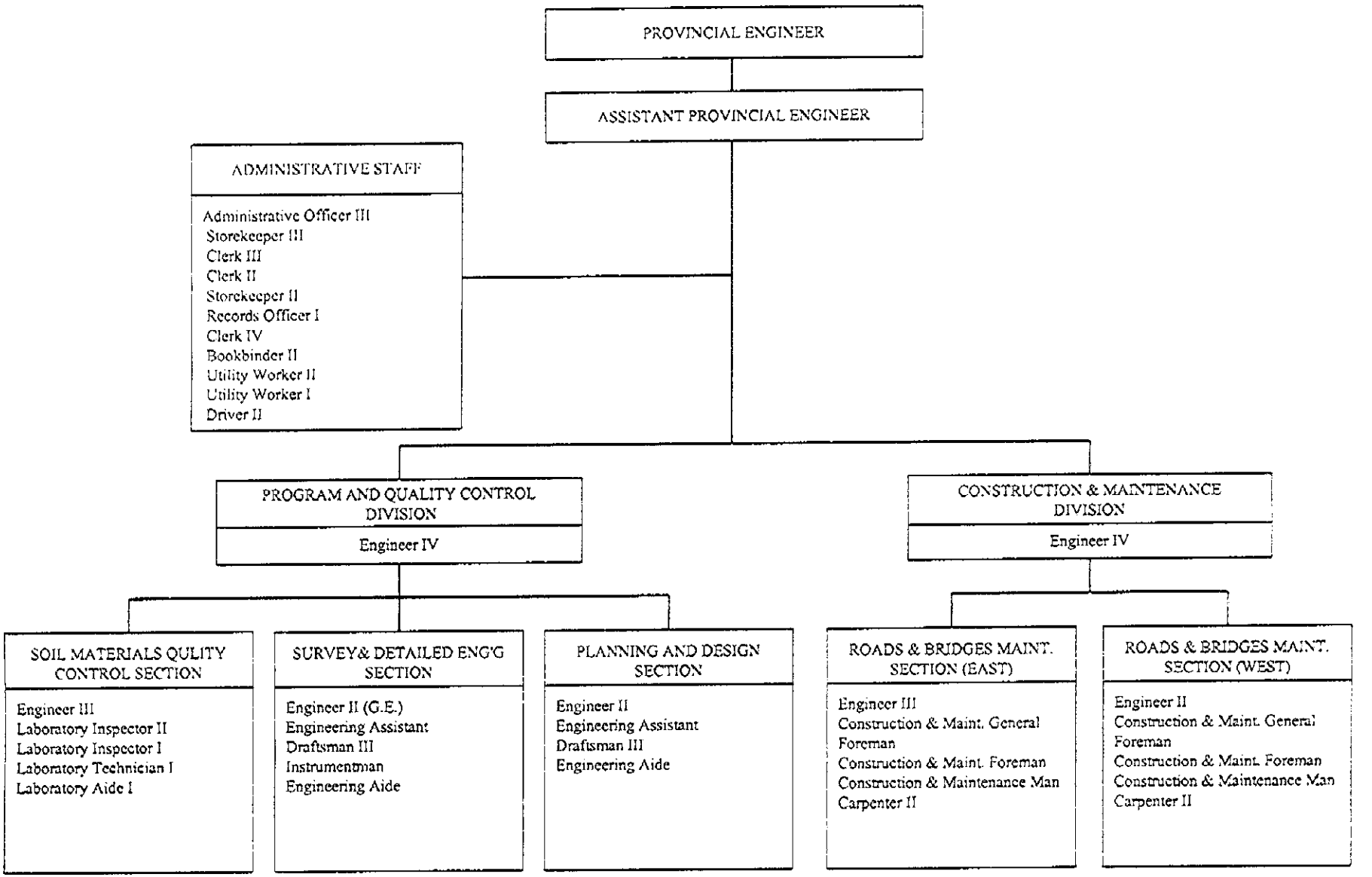


Figure 5.5.2 Organization Chart , Provincial Engineering Office of Agusan del Norte

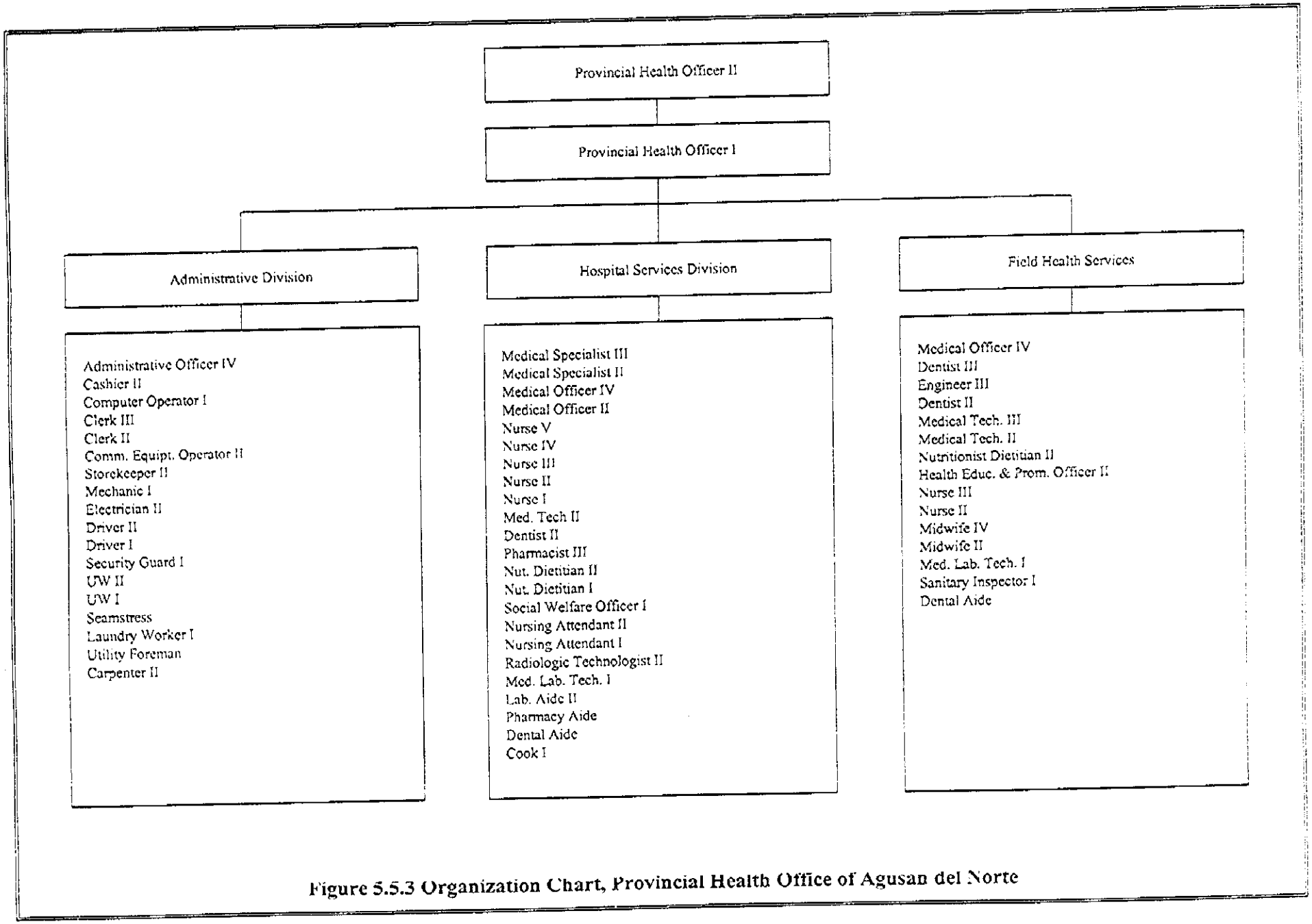


Figure 5.5.3 Organization Chart, Provincial Health Office of Agusan del Norte

5.6 External Support Agenciesin 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
OECF	Providing project loans for *capital infrastructure (urban.rural), agricultural development, export promotion.* 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 Yen Package/DILG; Co-financing AWSOP with World Bank and ADB/MWSS.
ADB	Providing both capital and technical assistance; Project loans: *agriculture, agri-industry, energy, social infra.,transport and communications;* Program Loans: sector loans (e.g., *forestry, livestock, environment*). 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 *education, training, development planning, resource management, environmental management, health/population, infrastructure (e.g. water supply, coal energy development), social infrastructure, community development and agriculture;* 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 *water supply and sanitation services and facilities, telecom ancillary equipment, small-scale power projects, environmental project, fishery and cold storage and past-harvest facilities;* Can finance up to 100% of foreign exhcange 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., *power generation, telecommunication, research involving high technology, water supply, air navigational equipment, etc.* Can finance 100% of foreign exchange costs of goods and services of French origin.	Feasibility Study for water supply project in Rizal province.

Donor	Priority Areas/Terms and Conditions	Programs and Projects in the Sector/Executing Agency
German Agency for Technical Cooperation (GTZ)	Providing grants for technical assistance. Promotion of *small and medium-scale industries, rural development, technical training, health/family planning, and environmental protection (forest management).*	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 *conduct of feasibility studies/master plans, provision of training, limited provision of equipment.* Capital assistance for *provision of euqipment/materials for construction of hospitals, schools, research, social welfare centers.* Priority areas include *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).* Can finance 100% of foreign exchange costs of covil 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.
UNDP	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) *-poverty and sustainable livelihood, protection and regeneration of the environment and sound governance, gender equality.*	WATSAN Program for LGUs and selected BWSAs/DILG.
UNICEF	Providing grant aids for technical assistance. Priority area: *social services, particularly for children.*	Community-based water supply program in Palawan Province; Water supply and sanitation Study for Southern Mindanao.
USAID	Providing grant aid within its strategic objectives. Six strategic objectives and one special objectives are: *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 resouces; reduce emissions of greenhouse gas; broaden participation in public formulation/implementation (selected areas); prevent rapid increase of HIV/AIDS.*	Barangay Water Program (BWP) for communities with populations of less than 10,000; TA for private sector participation in the sector.
World Bank	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 tehnical assistance in the form of ESW, IDF, Poverty and Human Resource Development Project Preparation and Policy Notes. Can finance 100% of foreign exchange costs of the project. Priority areas: *powerand energy, roads and railways, telecommunications, ports, water supply and sanitation, agriculture and social services.*	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.

5.7 Project Management Arrangement, and Issues and Problems

5.7.2 Institutional Aspect

Table 5.7.1 Office/Agencies involved in WATSAN project

Office/Agencies	Nature of Involvement
Provincial Engineering Office	Assists in the construction, operation and maintenance of the WATSAN facilities
Provincial Health Office	Conducts water quality examination Provides toilet facilities
DILG, Provincial Office	Conducts/assists training especially on topics related to human resource development
Barangay/Municipal governments thru MPDO	Identifies projects Provides counterpart support during implementation
District Engineering Offices I & II, DPWH Water Districts	Provides pipes Implements central govt. funded projects Provides water supply coverage in urban areas
CIDA-PMO Regional Office	Provides technical and financial assistance through its Local Govt. Support Program
Provincial General Services Office	Responsible in procurement of materials
Provincial Accounting and Audit Office, Provincial Budget Office & Provincial Treasury Office	Responsible in financial releases
NGOs	Provides consultancy services especially in CO/CD works
Sangguniang Panlalawigan	Appropriates funds

5.8 Community Development

5.8.1 General

(1) RESULTS OF THE BARANGAY KEY INFORMANT SURVEY FOR AGUSAN DEL NORTE

I. THE BARANGAY

A. General

The barangay is the smallest political unit in the Philippines. It is headed by a barangay captain who is elected for a three-year term. 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 improved economic activities in the community.

The key informant survey was conducted in five barangays representing three municipalities in Agusan 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: Soriano and Tolosa in the municipality of Cabadbaran; Caloc-an and Taod-oy in the municipality of Magallanes; and, Humilog in R.T.Romualdez.

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 is 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

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

There are no existing BWSAs in the five barangays surveyed. However, Barangay Soriano and Barangay Tolosa (Cabadbaran) identified community-based organizations that could act as water associations. The rest of the barangays could not identify community organizations for this purpose.

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

Three of the five barangay councils are willing to pay for the training of community members/volunteers on the operation and maintenance of the facilities. Another council could even arrange or facilitate for the training of the beneficiaries on O&M.

II. COMMUNITY PARTICIPATION

A. General

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 people 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 range from ₱2,000.00 to ₱4,000.00. The list of economic activities shows the following: livestock,

farming, vegetable gardening, sari-sari-store. The list shows both genders equally involved in these economic activities.

2. Water Borne/Water Related Diseases

Incidences of water borne and water related diseases were reported in all the barangays surveyed. This could be traced to unreliable sources of drinking water and the absence of BWSAs or other organizations that maintain water supply facilities.

C. Willingness to Participate

1. Initiating the Organization of a WATSAN Association

Each of the five 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. A big majority also 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, the majority 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

There are no existing BWSAs in areas that were surveyed. The barangay councils of three barangays operate the community water system while the other three barangays are being served by privately-owned water supply facilities that are being maintained by their owners.

2. Status of NGOs/CBOs/POs

Only two among the five barangays surveyed reported having NGOs/CBOs that do work in their communities. The areas of concern of these NGOs focus mostly on increased agriculture and fishing productivity. Those specifically related to sector needs are the: (1) Samahang Nayon (headed by Mr. Simeon Bergosa) which organizes farmers cooperatives

and in community organizing; and, (2) Rural Improvement Club (headed by Elsa Benedicto) for leadership and 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. One barangay also depends on surface water. All water facilities are still functional but occasionally have problems. Many of the respondents could not determine if what they drink is fit for drinking.

2. Common Difficulties and O&M Problems Encountered

Common problems cited by the respondents range from defective pumps 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

Residents in all the five barangays surveyed do not pay fees for the use of the water facilities.

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 financial assistance from the municipal and provincial government. The amounts of financial assistance ranged from ₱25,000.00 to ₱1 million for the years 1996-1997 and were used for the purchase of materials in the construction of water supply facilities.

III. GENDER

A. General

The importance placed on gender is still something new in the province. Although most of the survey results do not point to a severe lack of responsiveness to sector projects, the awareness as to why there must be gender equality was not yet fully comprehended by most of the key informants.

B. Gender in the Composition of the Barangay Council

In the five barangays surveyed, the total number of barangay council members is 35. Of this number, 24 were males and 11 females. The barangay councils are not male-dominated; two of the barangay chairmen are females.

C. Gender in the Composition of the BWSA

There are no existing BWSAs in all barangays surveyed.

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

Most of the key informants indicated that the women could participate in the O&M of the water facilities. Both male and female informants believed that women could be the ones to make and follow-up request to barangay officials for assistance in the construction of water facilities. The men, on the other hand, could do simple repair works.

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.

(2) RESULT OF GROUP INTERVIEW (AGUSAN DEL NORTE)

1.1 General

Group interviews were conducted in two selected barangays representing two municipalities in the province of Agusan del Norte. The objectives of the group survey/interviews were to identify potential service population and service level desired by the community, to assess the degree of involvement of both men and women in planning, managing, operating and maintaining WATSAN projects, and the willingness and capacity to pay of potential users.

The Project Team conducted the interviews on two sets of interviewees: an all female group and an all male group, each consisting of a minimum of 10 and a maximum of 20 participants. None of the respondents belonged to the same household. Answers to interview questionnaires were made by raising of hands. The group interviews were conducted in the following barangays: Humilog (R.T. Romualdez) and Taod-oy (Magallanes).

1.2 Demographic Profile

(1) Population

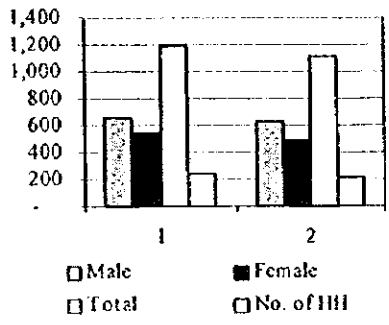
The aggregate population in the two barangays totaled 2,305, breakdown of which is as follows: Humilog, 1,186 (650 males, 536 females) and Taod-oy, 1,119, (627 males, 492 females).

(2) Households

As indicated by the respondents, there are 551 households in the two barangays. Breakdown per barangay is: Humilog, 237 and Taod-oy, 214. The figure represents an average of five members per household.

TABLE 1: TOTAL POPULATION OF BARANGAYS AND NUMBER OF HOUSEHOLDS

BARANGAY (MUNICIPALITY)	M	F	T	NO. OF HH
1. Humilog (R.T. Romualdez)	650	536	1,186	237
2. Taod-oy (Magallanes)	627	492	1,119	214
TOTAL	1,277 (55.40%)	1,028 (44.60%)	2,305 (100%)	451



(3) Composition of Barangay Councils

There are 14 barangay council members in the two barangays. Of the barangay council members, eight were males and six females. All barangay captains were males.

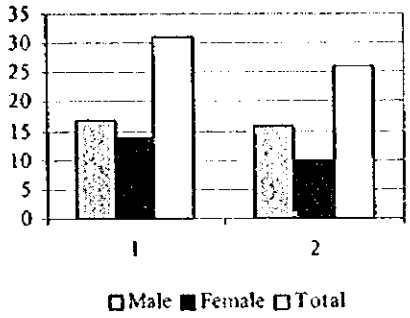
1.3 Respondents' Profile

(1) Number and Gender of Respondents

There were 57 respondents in the group interviews. Of these, 33 or 57.90 percent were males and 24, or 42.10 percent were females. Below is the breakdown of the number of respondents by gender for each barangay:

TABLE 2: NUMBER OF RESPONDENTS

BARANGAY (MUNICIPALITY)	M	F	T
1. Humilog	17	14	31
2. Taod-oy	16	10	26
TOTAL	33 (57.90%)	24 (42.10%)	57 (100%)

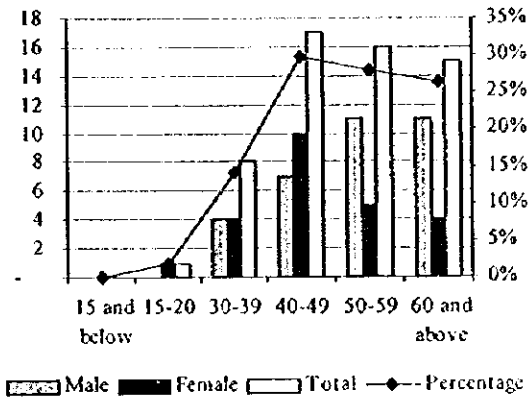


(2) Age Bracket

The majority of the respondents or 17 belonged to 40 to 49 age bracket, with females outnumbering males, 10 to 7. A total of 16 (11 males, 5 females) were under the 50 to 59 age bracket, while 15 respondents (11 males, 4 females) belonged to 60 and above age bracket. Four males and four females, or a total of 8 respondents belonged to the 30 to 39 age bracket.

TABLE 3: AGES OF THE RESPONDENTS

AGE BRACKET	M	F	T	%
15 and below	-	-	-	-
15-20	-	1	1	1.75
30-39	4	4	8	14.00
40-49	7	10	17	29.85
50-59	11	5	16	28.10
60 and above	11	4	15	26.30
TOTAL	33	24	57	100.00

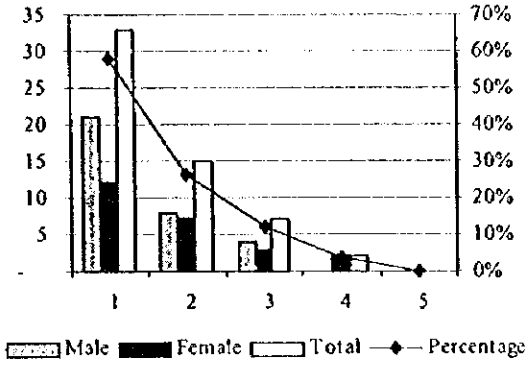


(3) Level of Education

Thirty three (33) respondents attended elementary level of education. Another 15 respondents reached the high school level, and seven attended college education. Two respondents pursued vocational course.

TABLE 4: RESPONDENTS' LEVEL OF EDUCATION

EDUCATIONAL LEVEL	M	F	T	%
1. Elementary	21	12	33	57.90
2. High School	8	7	15	26.30
3. College	4	3	7	12.30
4. Vocational	-	2	2	3.50
5. Post Graduate	-	-	-	-
TOTAL	33	24	57	100.00

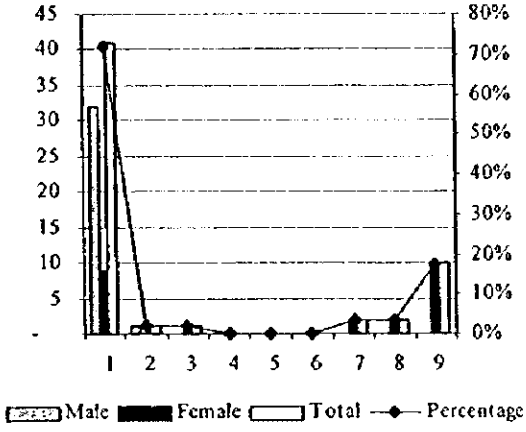


(4) Occupation

The majority of the respondents (41) are presently engaged in either farming or fishing. The males outnumbered the females in this work category, 32 to 9. Other occupations of the respondents include: dressmaker (2 females); service worker and technician. Ten respondents did not respond to this question.

TABLE 5: OCCUPATION OF RESPONDENTS

OCCUPATION	M	F	T	%
1. Farmer/Laborer	32	9	41	71.90
2. Technician	1	-	1	1.75
3. Service Worker	-	1	1	1.75
4. Businessman/woman	-	-	-	0
5. Professional	-	-	-	0
6. Office Worker	-	-	-	0
7. Dressmaker	-	2	2	3.50
8. Others	-	2	2	3.50
9. No Response	-	10	10	17.50
TOTAL	33	24	57	100.00



1.4 Socio Economic Profile

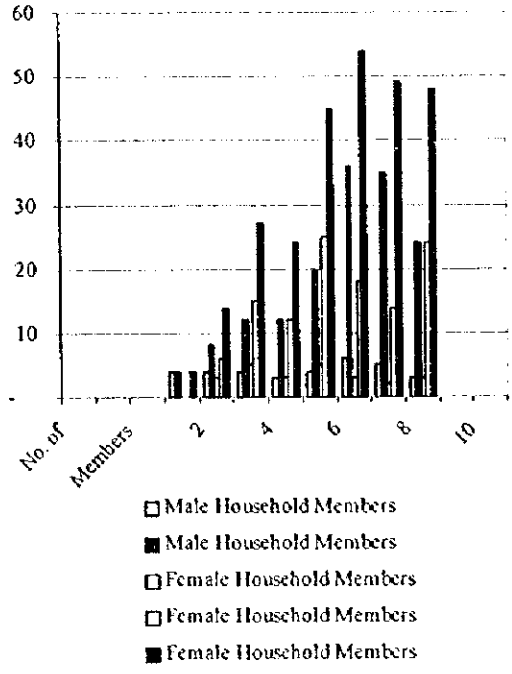
(1) Number of Household Members

The total number of household members of the respondents is 265. Males outnumber females in the respondents' households. There were 151 or 57% males; while there are

114 or 43% females. The figures represent an average of almost five members per household.

TABLE 6: NUMBER OF HOUSEHOLD MEMBERS

NO. OF HH MEMBERS	MALE HOUSEHOLD MEMBERS		FEMALE HOUSEHOLD MEMBERS		TOTAL HOUSEHOLD MEMBERS
	NO. OF RESPONDENTS	TOTAL MALE HH MEMBERS	NO. OF RESPONDENTS	TOTAL FEMALE HH	
1	4	4	-	-	4
2	4	8	3	6	14
3	4	12	5	15	27
4	3	12	3	12	24
5	4	20	5	25	45
6	6	36	3	18	54
7	5	35	2	14	49
8	3	24	3	24	48
9	-	-	-	-	-
10	-	-	-	-	-
TOTAL	33	151 (57.00%)	24	114 (43.00%)	265 (100.00%)

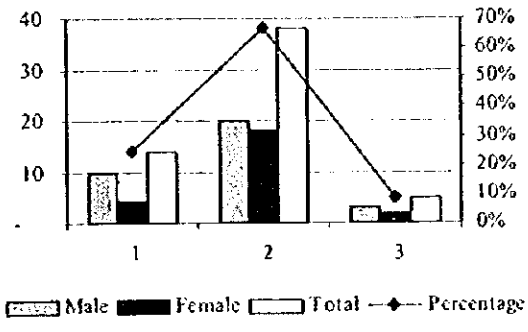


(2) Ages of Household Members

As pointed out by most male and female respondents, the majority of the household members belonged to the 15-60 age bracket. Male household members outnumbered female members in this age bracket. The 15 and below age level was the second largest age group; while the 60 and above age group has the least number in it.

TABLE 7: AGES OF HH MEMBERS

AGE	M	F	T	%
1. 15 and below	10	4	14	24.55
2. 15-60	20	18	38	66.65
3. 60 and above	3	2	5	8.80
TOTAL	33	24	57	100.00



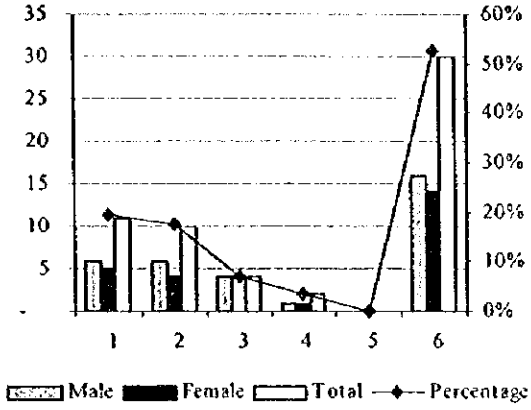
(3) Level of Education of Household Members

The majority of the respondents (30) could not determine the level of education of their household members. But for those who responded, most (11) indicated that their

household members have reached elementary education. Meanwhile, 10 respondents said their members attended high school, and two graduated from vocational courses.

TABLE 8: LEVEL OF EDUCATION OF HH MEMBERS

EDUCATIONAL LEVEL	M	F	T	%
1. Elementary	6	5	11	19.30
2. High School	6	4	10	17.55
3. College	4		4	7.00
4. Vocational	1	1	2	3.50
5. Post Graduate	-	-	-	-
6. No Response	16	14	30	52.65
TOTAL	33	24	57	100.00

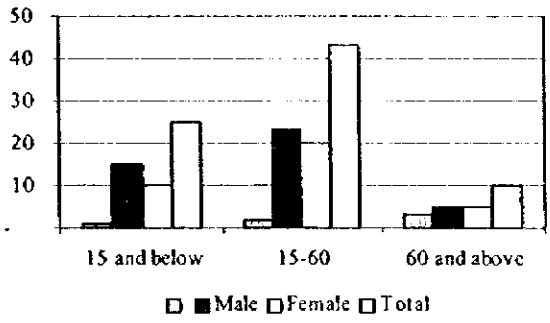


(4) Employed Household Members

There are 78 among the respondents' household members who are gainfully employed or had a regular source of income. Employed men outnumbered working women, 43 to 35. The majority of these productive people belonged to the 15 to 60 age bracket with 23 males and 20 females, for a total of 43. There were 25 people, or 15 males and 10 females, belonging to the 15 and below age who were likewise employed. On the other hand, ten (10) family members under the 60 years old and above were still working.

TABLE 9: EMPLOYED HH MEMBERS

AGE BRACKET	M	F	T
15 and below	15	10	25
15-60	23	20	43
60 and above	5	5	10
TOTAL	43	35	78



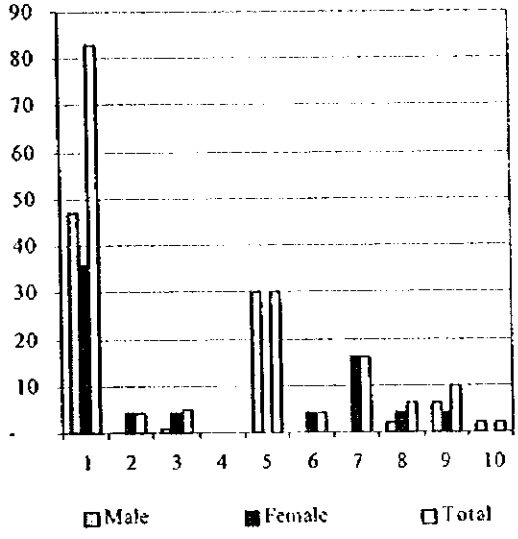
(5) Occupation of Household Heads and Other Members

The majority of the household heads and members, (83) were engaged in either farming or fishing where they derived income. Males constituted the majority of workers in this field, 47 to 36. There were also laborers (30), service workers (16) while other respondents are engaged in other occupations such as technician, equipment operator, vendors, carpenters and businessmen/women.

Most of those who were gainfully employed, 31 males and 21 females or a total of 52 workers, earned an average monthly income of ₱5,000.00 and below. Only five workers or two males and three females earned more than ₱5,000.

TABLE 10: OCCUPATION OF HH MEMBERS

OCCUPATION	M	F	T
1. Farmer/Fisherfolk	47	36	83
2. Professional	-	4	4
3. Technician	1	4	5
4. Office Worker	-	-	-
5. Laborers	30	-	30
6. Equipment Operator/Welder	-	4	4
7. Service Worker	-	16	16
8. Businessman/woman	2	4	6
9. Vendor/Carpenter/Dressmaker	6	4	10
10. Others	2	-	2
TOTAL	88	72	160

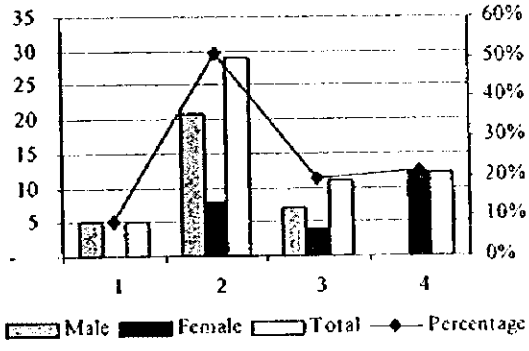


(6) Economic Activities

Aside from their regular source of income, 57 household members engaged in other economic activities to augment their monthly income. As indicated by most of the respondents, vegetable gardening was the main livelihood project of the people. Men were more involved in economic activities than women. Sari-sari store operation was the second most popular livelihood project followed by livestock/poultry raising. From these economic activities, almost all of the household members earned less than ₱500.00. Ten members earned more than ₱500.00.

TABLE 11: ECONOMIC ACTIVITIES OF HH MEMBERS

ECONOMIC ACTIVITY	M	F	T	%
1. Livestock/Poultry	5	-	5	8.75
2. Vegetable/gardening	21	8	29	50.90
3. Sari-sari store	7	4	11	19.30
4. No response	-	12	12	21.05
TOTAL	33	24	57	100.00

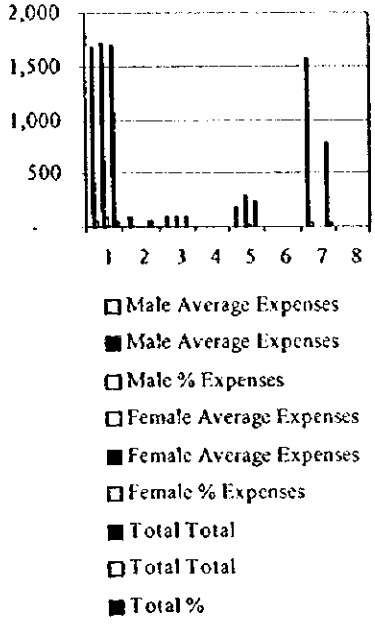


(7) Average Expenditures of Household

As indicated by the respondents, the average monthly expenditure of a family was ₱2,837.65. The male respondents indicated higher monthly expenditures at ₱3,601.60 mainly due to their inclusion of high recreation expenses of ₱1,560.80. Without the recreation expenses, the women had a low average monthly expense of ₱2,073.50. Nevertheless, both the male and female interviewees said the biggest expenditure was allotted to food at an average of ₱1,688.50 a month, which is 59.50% of the total monthly expenditures. The female respondents gave a higher figure for food expenses than the males (see Table 12). The lowest family expenditure for both male and female interviewees was for water with an average expenses of ₱48.75 a month or 1.75% of the monthly expenses. Education was the second highest expenditure with an average of ₱234.50 (8.25%), followed by electricity (₱85.50 or 3.0%). Surprisingly, expenses for clothing were not included in the monthly expenditure. Except for recreation, the female respondents gave higher estimates for all items.

TABLE 12: AVERAGE EXPENDITURES OF HH MEMBERS

ITEM	MALE		FEMALE		TOTAL	
	AVERAGE EXPEN-SES	%	AVERAGE EXPEN-SES	%	TOTAL AVERAGE	%
1. Food	₱ 1,670.00	46.35	₱ 1,707.00	82.35	₱1,688.50	59.50
2. Water	97.50	2.70	-	-	48.75	1.75
3. Electricity/Fuel	86.50	2.40	84.50	4.05	85.50	3.00
4. House Rental	-	-	-	-	-	-
5. Education	186.80	5.20	282.00	13.60	234.50	8.25
6. Clothing	-	-	-	-	-	-
7. Recreation	1,560.80	43.35	-	-	780.40	27.50
8. Others	-	-	-	-	-	-
TOTAL	₱ 3,601.60	100.00	₱ 2,073.50	100.00	₱2,837.65	100.00

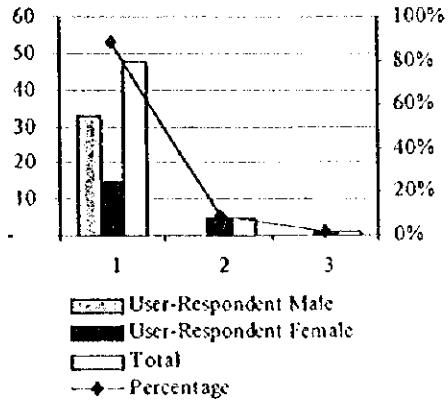


(8) Practices

Source of Drinking Water. The majority of the respondents (48) indicated that the people get their source of drinking water from communal free flow wells. Other sources mentioned were: communal deepwell (5 respondents), and communal shallow well, (4).

TABLE 13: SOURCES OF DRINKING WATER

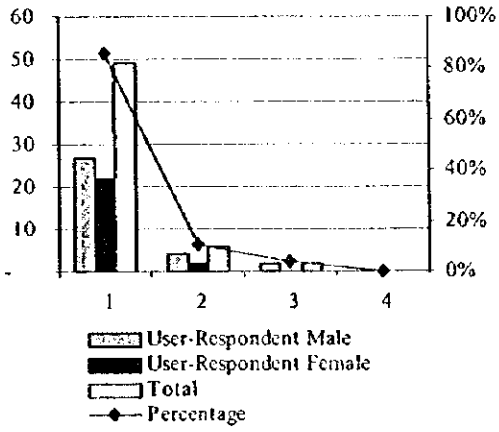
SOURCE	USER-RESPON-DENT		T	%
	M	F		
1. Communal Free Flow Well	33	15	48	84.25
2. Communal Deep Well	-	5	5	8.75
3. Communal Shallow Well		4	4	7.00
TOTAL	33	24	57	100.00



Responsible for Fetching Water. The majority of the respondents, 27 males and 22 females for a total of 49, said that the husband is still the one responsible for hauling drinking water for family use. The women also shared the burden as six respondents, four males and two females, indicated that the wives are doing the task.

TABLE 14: RESPONSIBLE FOR FETCHING DRINKING WATER

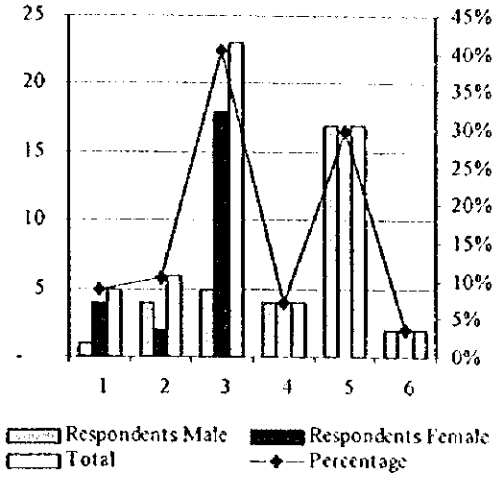
FAMILY MEMBER	USER-RESPON-DENT		T	%
	M	F		
1. Husband	27	22	49	85.95
2. Wife	4	2	6	10.55
3. Male Children	2	-	2	3.50
4. Female Children	-	-	-	-
TOTAL	33	24	57	100.00



Frequency of Fetching Water. The majority of male respondents indicated that families fetch drinking water five times a day. For the female respondents, it took three times a day to haul water for domestic use. Six interviewees said they get water twice a day; five indicated once a day, and four said four times a day. Two respondents indicated more than five times a day.

TABLE 15: FREQUENCY OF FETCHING DRINKING WATER

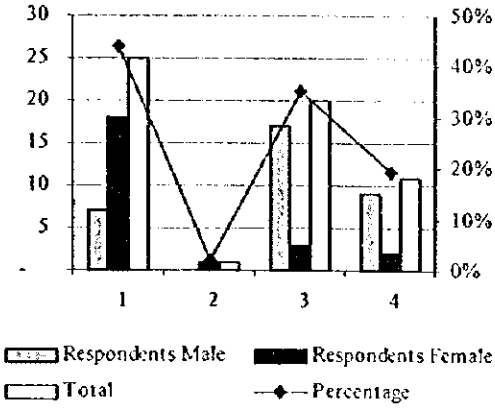
FREQUENCY	RESPON-DENTS		T	%
	M	F		
1. Once a Day	1	4	5	8.75
2. Twice a day	4	2	6	10.50
3. 3x a day	5	18	23	40.35
4. 4x a day	4	-	4	7.00
5. 5x a day	17	-	17	29.80
6. More	2	-	2	3.50
TOTAL	33	24	57	100.00



Duration of Fetching Water. For most of the male respondents (17), it takes about 30 minutes to fetch water from the source to their house. For most of the female (18) and another seven male interviewees, however, one takes only about 10 minutes to haul water. Twenty respondents (17 males, 3 females) indicated 30 minutes; while 11 respondents said it takes more than 30 minutes.

TABLE 16: DURATION FOR FETCHING DRINKING WATER

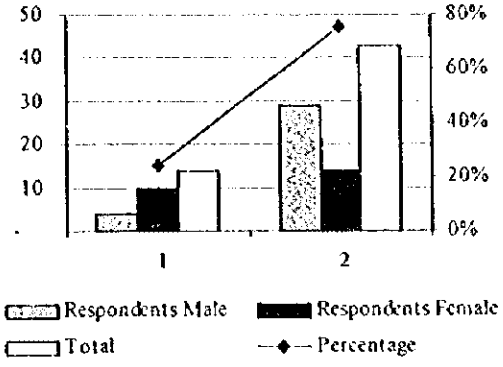
DURATION	RESPON-DENTS		T	%
	M	F		
1. About 10 minutes	7	18	25	43.85
2. About 20 minutes	-	1	1	1.75
3. About 30 minutes	17	3	20	35.10
4. More than 30 minutes	9	2	11	19.30
TOTAL	33	24	57	100.00



Problems with Source. The majority of respondents, 29 males and 14 females, admitted that they have problems with the current water source. On the other hand 14 respondents said they have no problems with the current situation.

TABLE 17: PROBLEMS WITH SOURCE OF WATER

RESPONSE	RESPON-DENTS		T	%
	M	F		
1. No Problem	4	10	14	24.55
2. There are problems	29	14	43	82.45
TOTAL	33	24	57	100.00



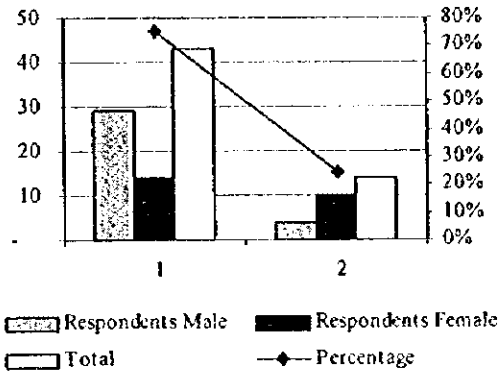
1.5 Institutional

(1) Presence of BWSA

Majority of the male respondents (29) indicated that there is a BWSA in their communities. Likewise, most of the female respondents (14) said there was a BWSA in the barangay.

TABLE 18: KNOWLEDGE OF THE EXISTENCE OF BWSA

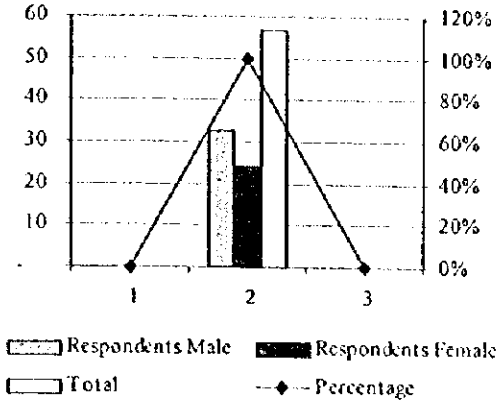
RES-PONSE	RESPON-DENTS		T	%
	M	F		
1. Yes	29	14	43	75.40
2. No	4	10	14	24.60
TOTAL	33	24	57	100.00



Corollary to this, nobody among the respondents indicated that he or she is BWSA officer or a member. The respondents also said that they are not actively involved in the affairs of the BWSA.

TABLE 19: MEMBERSHIP TO THE BWSA

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Yes	-	-	-	-
2. No	33	24	57	100.00
3. No response	-	-	-	-
TOTAL	33	24	57	100.00

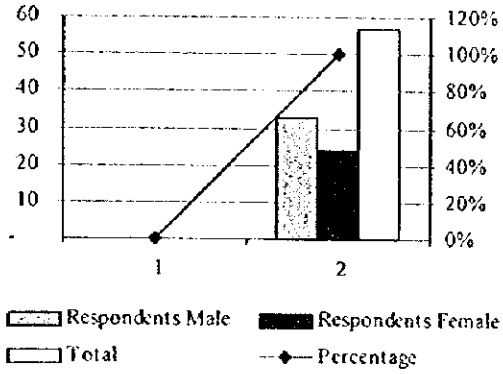


(2) Who maintains the facilities of the BWSA?

All of the respondents could not determine the people responsible for maintaining the facilities.

TABLE 20: RESPONSIBLE FOR MAINTAINING WATSAN FACILITIES

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Someone in the Barangay	-	-	-	-
2. No Response	33	24	57	100.00
TOTAL	33	24	57	100.00

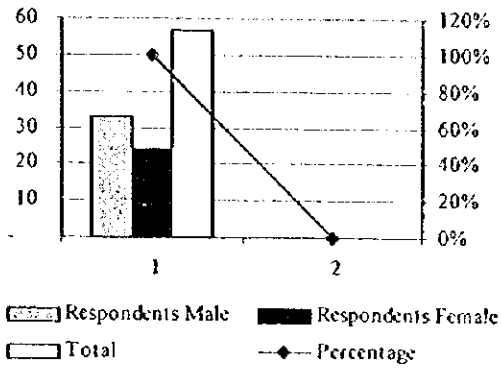


(3) Interested to be a member of BWSA

Significantly, all respondents indicated interest in becoming a member of BWSA once it is formed and/or activated in their respective barangays.

TABLE 21: INTEREST OF RESPONDENTS TO JOIN BWSA

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Interested	33	24	57	100.00
2. Not interested	-	-	-	-
TOTAL	33	24	57	100.00

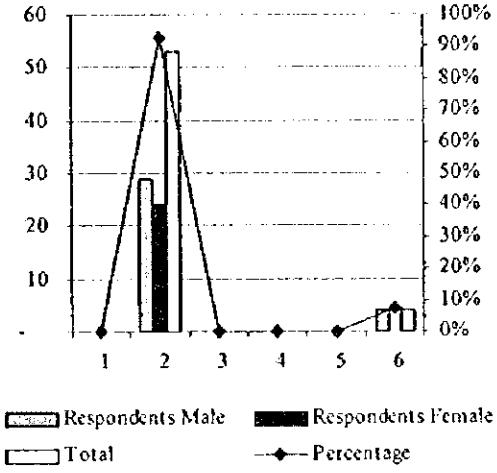


(4) How can respondents become actively involve in BWSA affairs?

A total of 53 of the respondents, or 29 males and 24 females, is willing to contribute free labor as a manifestation of their active involvement with the BWSA. Only four male respondents preferred to just be members of the BWSA.

TABLE 22: HOW RESPONDENTS CAN BECOME ACTIVELY INVOLVED IN WATSAN PROJECTS

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Contribute Cash	-	-	-	-
2. Contribute Labor	29	24	53	93.00
3. Do repair/maintenance	-	-	-	-
4. Collection of Fees	-	-	-	-
5. Be Officer	-	-	-	-
6. Just Member	4	-	4	7.00
TOTAL	33	24	57	100.00

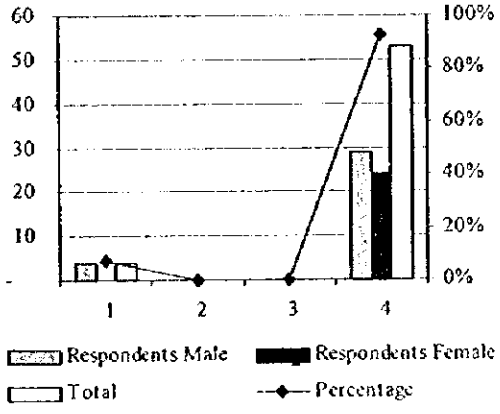


(5) If not interested, where to get source of water

In the event that these respondents will not be members of the BWSA, majority (26 males, 30 females) said that they will be obliged to fetch water from other sources available in the community. Four of them will still avail from existing communal well.

TABLE 23: SOURCES OF DRINKING WATER OF NON-BWSA MEMBERS

SOURCE OF WATER	RESPONDENTS		T	%
	M	F		
1. Communal Well	4	-	4	7.00
2. Spring	-	-	0	-
3. Vendor	-	-	0	-
4. Others	29	24	53	93.00
TOTAL	33	24	57	100.00

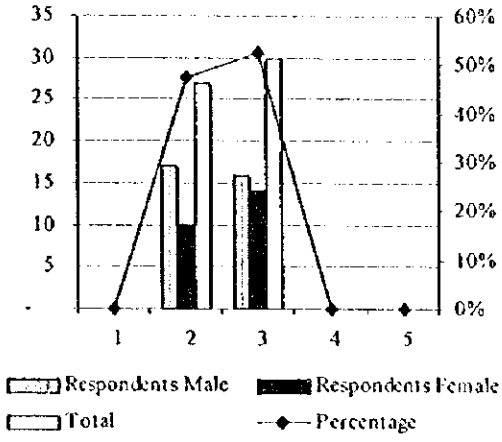


(6) Responsible for minor repairs of water facilities

Someone in the barangay, according to the majority of the respondents (30), was responsible for doing minor repairs of the family's water supply facility. However for 27 respondents, the male member is doing the repair works.

TABLE 24: RESPONSIBLE FOR MINOR REPAIRS

RESPONSIBLE PERSON	RESPONDENTS		T	%
	M	F		
1. Female Member	-	-	-	-
2. Male Member	17	10	27	47.35
3. Somebody in the Barangay	16	14	30	52.65
4. Professional caretaker	-	-	-	-
5. Owner of the well	-	-	-	-
TOTAL	33	24	57	100.00



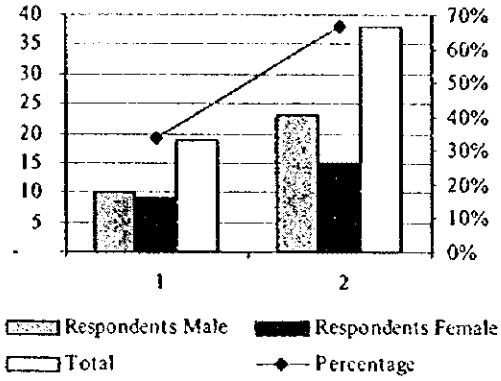
1.6 Training Activities

(1) Training Program attended in 1997

Majority of the respondents, 23 male and 15 female respondents, said they did not attend any training program in 1997. For 10 male and 9 female interviewees, they were able to attend training programs/seminars on the following subject matters: Farmer's Training/Agriculture; Sanitation; Barangay Health, Barangay Administration; Cooperative; Financial Management; and, Crime Prevention.

TABLE 25: TRAINING ATTENDED BY RESPONDENTS IN 1997

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Yes	10	9	19	33.35
2. No	23	15	38	66.65
TOTAL	33	24	57	100.00



(2) Kinds of Training Program

The respondents attended various training programs in 1997. Table 24 summarizes the training programs/seminars attended by the respondents during the year.

TABLE 26: TRAINING COURSES ATTENDED BY RESPONDENTS IN 1997

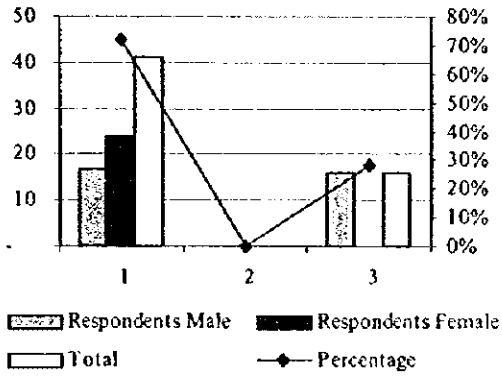
BARANGAY	MALE	FEMALE
Barangay Humilog (RTR)	1. Barangay Administration 2. Barangay Polisia Laban sa Krimen (Crime Prevention) 3. Financial Administration 4. Lupon Tagapamayapa (Barangay Justice)	1. Barangay Administration 2. Barangay Health
Taod-oy (Magallanes)	-	1. Barangay Administration

(3) On BWSA Training

All the respondents were not aware of any training program for BWSA members. However, the majority (17 males and 24 females) wanted to attend in any BWSA training program for the barangay. All the other 16 male respondents could not determine whether they would attend or not.

TABLE 27: WILLINGNESS TO ATTEND BWSA-RELATED TRAINING PROGRAMS

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Yes	17	24	41	71.90
2. No	-	-	-	-
3. Uncertain	16	-	16	28.10
TOTAL	33	24	57	100.00

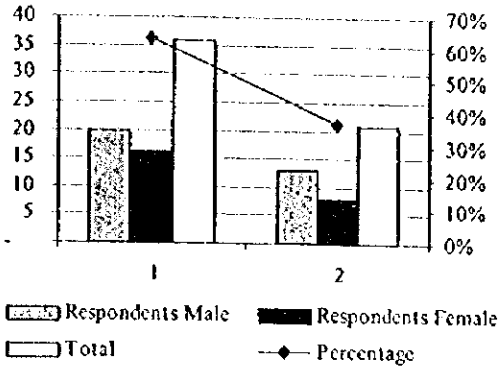


(4) Training on Health Education

The majority of the respondents, or 20 males and 16 females have attended health education training program. The other interviewees, or 13 males and eight females have not heard of any health training program. If given a chance, however, the respondents wanted to attend WATSAN related training programs such as: BWSA Skills Training Program (O&M); Health and Sanitation; Proper Usage of Water; Barangay Development; and, Livelihood.

TABLE 28: PARTICIPATION IN HEALTH EDUCATION AND TRAINING

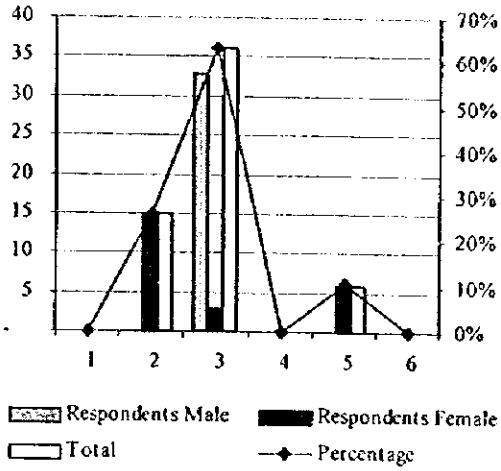
RESPONSE	RESPONDENTS		T	%
	M	F		
1. Yes	20	16	36	63.15
2. No	13	8	21	36.85
TOTAL	33	24	57	100.00



In relation to this, all male respondents wanted to attend training programs that would be conducted for two days. On the other hand, the female respondents varied in their choices although the majority of them desired for a one-day training period. Six female interviewees wanted more than three days and three opted for a two-day training schedule.

TABLE 29: DESIRABLE TRAINING PERIOD

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Less than 1 day	-	-	-	-
2. One day	-	15	15	26.30
3. Two days	33	3	36	63.15
4. Three days	-	-	-	-
5. More than 3 days	-	6	6	10.55
6. Uncertain	-	-	-	
TOTAL	33	24	57	100.00



1.7 Community Development

(1) CBOs and contact persons

As pointed out by the respondents, some community-based organizations have been doing different development works in the barangays. Table 30 lists down these NGOs/CBOs and their contact persons:

Table 30: NGOs/CBOs in the Barangays

BARANGAY	CONTACT PERSON
A. Humilog (RTR)	
1. PCA	Mr. Renato Montella
2. Senior Citizens	Mr. Patricio Eliot
3. Farmers Association	Mr. Cepiano Montella
4. CVO	Mr. Antonio dela Pena (Bgy. Captain)
B. Taod-oy (Magallanes)	
1. Farmers Association	
2. BPMPC - Balite Bakikihan MPC	
3. PCA	

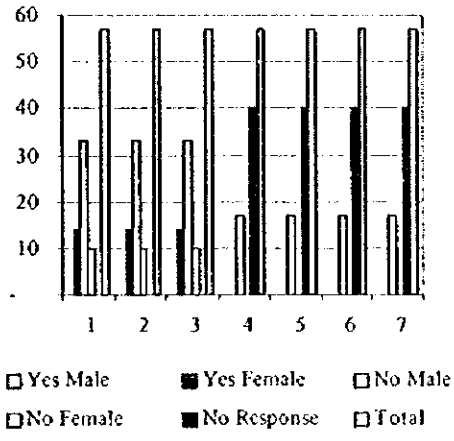
(2) Were the respondents consulted on their respective roles and responsibilities?

All male respondents indicated they were not consulted and/or briefed on their proposed roles and responsibilities on the planning, design and construction of their water supply facilities. This is also true for the operation and maintenance and financing aspects of the system where the same number of respondents claimed they were not consulted. On the other hand, about 14 female respondents said they were consulted on their involvement in the planning, design, operation and maintenance and financing of their water system.

In the same manner, all the male and female respondents indicated that they were never consulted when the BWSA was formed in their respective barangays as well as when the level/type of services and water fees were agreed upon. A combined 40 male and female respondents did not respond to this issues.

TABLE 31: RESPONDENTS CONSULTED/INVOLVED IN PAST WATSAN PROJECTS

BWSA ACTIVITIES	YES		NO		NO RES-PONSE	T
	M	F	M	F		
1. Planning and Design	-	14	33	10	-	57
2. O&M of the system	-	14	33	10	-	57
3. Financing of the system	-	14	33	10	-	57
4. BWSA Formation	-	-	17	-	40	57
5. Water Fee Decision	-	-	17	-	40	57
6. Level of Service Decided	-	-	17	-	40	57
7. Construction of Facilities	-	-	17	-	40	57

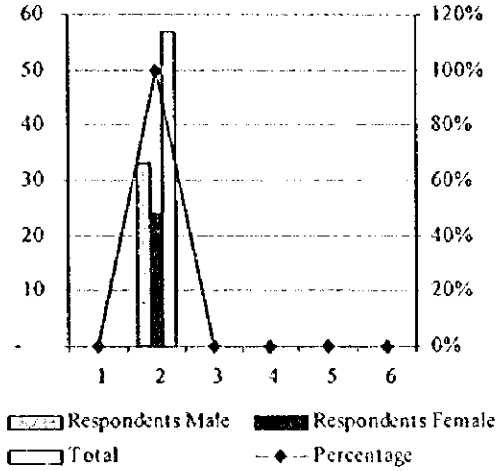


(3) How did the respondents participate in past construction projects?

All of male and female respondents participated in the construction of previous WATSAN facilities by providing labor.

TABLE 32: PARTICIPATION IN PAST CONSTRUCTION PROJECTS

TYPE OF PARTICIPATION	RESPONDENTS		T	%
	M	F		
1. Provided Cash	-	-	-	-
2. Provided Labor	33	24	57	100.00
3. Do repair/maintenance	-	-	-	-
4 Donated Site	-	-	-	-
5. Provided Materials	-	-	-	-
6. No Response	-	-	-	-
TOTAL	33	24	57	100.00

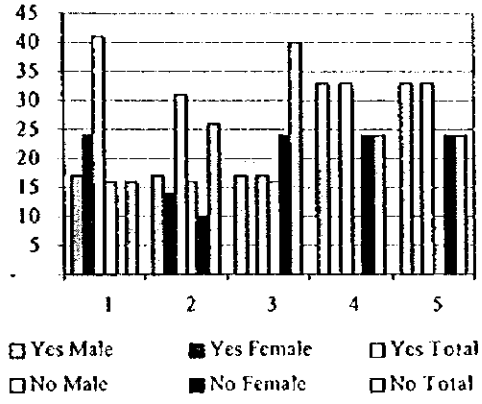


(4) Will the respondents participate in future projects?

For future projects, however, the majority of the respondents indicated that they would participate and/or contribute for certain activities. For the formation of BWSA, all female respondents will participate but only 17 male respondents will be involved. On the formulation of water rates, 17 male and 14 female interviewees will likely participate. In the selection of sites, construction of facilities and in the operation and maintenance however, only the male respondents signified intention to participate.

TABLE 33: WILLINGNESS/TYPE OF PARTICIPATION IN FUTURE PROJECTS

PROJECT ACTIVITY	YES			NO		
	M	F	T	M	F	T
1. Formation of BWSA	17	24	41	16	-	16
2. Water rates Formulation	17	14	31	16	10	26
3. Selection of sites	17	-	17	16	24	40
4. Construction of facilities	33	-	33	-	24	24
5. Operation & maintenance	33	-	33	-	24	24



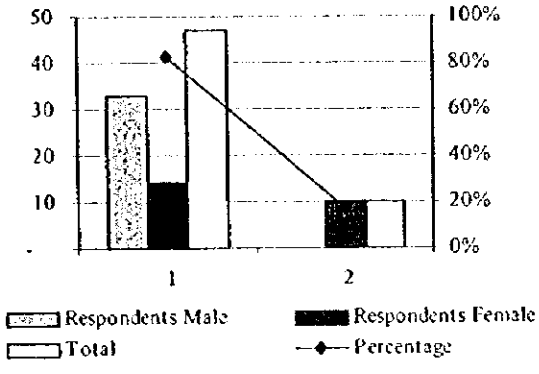
1.8 Financial Aspects

(1) Are respondents presently paying for their water supply?

All the male respondents, together with 14 female interviewees claimed they are presently paying for their water supply. The rest of the female interviewees indicated they are not paying.

TABLE 34: NUMBER OF RESPONDENTS PRESENTLY PAYING WATER FEE

RESPONSE	RESPON-DENTS		T	%
	M	F		
1. Yes	33	14	33	57.90
2. No	-	10	24	42.10
TOTAL	33	24	57	100.00

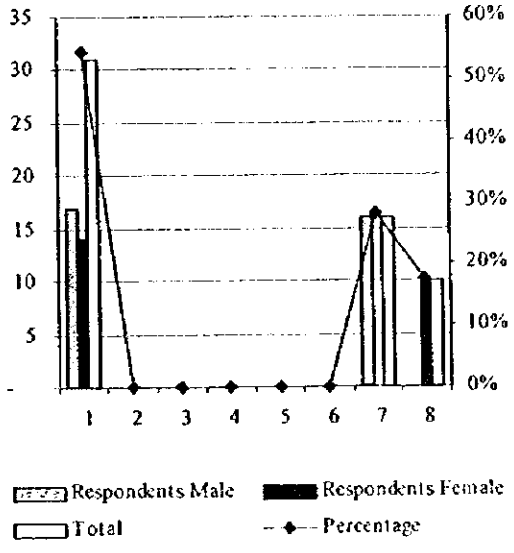


(2) If so, how much per household?

Of those presently paying, the majority indicated that they were paying only from ₱2.00 up to ₱5.00. Sixteen male respondents said they were ₱50.00 and above. The rest of the respondents had no response.

TABLE 35: PRESENT WATER FEES PAID

WATER FEES	RESPON-DENTS		T	%
	M	F		
1. ₱2.00 – ₱5.00	17	14	31	54.40
2. ₱6.00 – ₱10.00	-	-	-	-
3. ₱11.00 - ₱20.00	-	-	-	-
4. ₱21.00 - ₱30.00	-	-	-	-
5. ₱31.00 - ₱40.00	-	-	-	-
6. ₱41.00 - ₱50.00	-	-	-	-
7. Above ₱50.00	16	-	16	28.05
8. No response		10	10	17.55
TOTAL	33	24	57	100.00

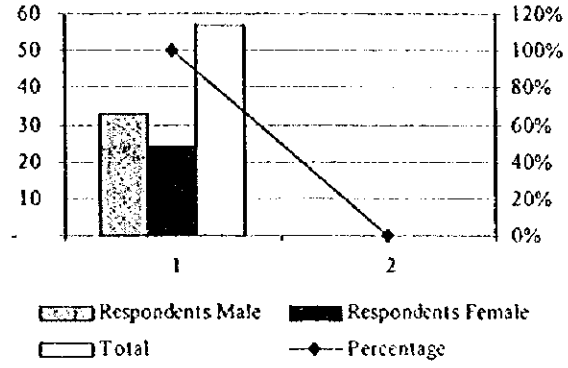


(3) Is the water fee enough for O&M?

For respondents who were paying water fees, all agreed that the fees being collected were enough to operate and maintain the facilities.

TABLE 36: ADEQUACY OF WATER FEE FOR O&M

RESPONSE	RESPON-DENTS		T	%
	M	F		
1. Yes	33	24	57	100.00
2. No	-	-	-	-
TOTAL	33	24	57	100.00

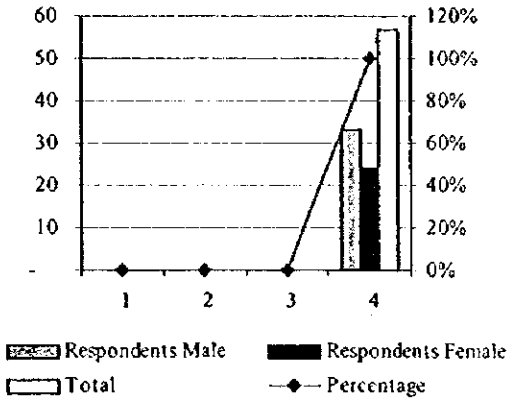


(4) Who shoulders the O&M of Facilities?

All the respondents could not determine which group/s in the community shoulder the operation and maintenance of the water supply facilities.

TABLE 37: RESPONSIBILITY FOR SHOULDERING THE O&M COSTS

PERSON	RESPON-DENTS		T	%
	M	F		
1. Barangay Council	-	-	-	-
2. Municipal Government	-	-	-	-
3. Owner of the well	-	-	-	-
4. Uncertain	33	24	57	100.00
TOTAL	33	24	57	100.00

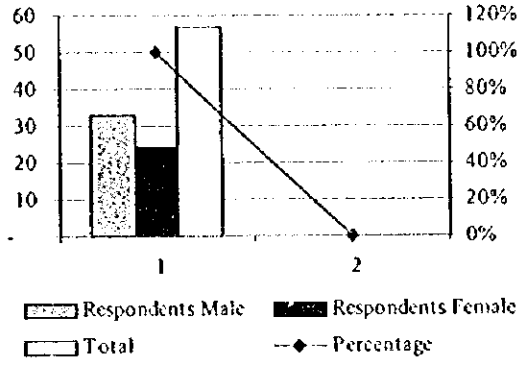


(5) Are the people willing to pay for O&M of future facilities?

All the respondents expressed willingness to pay/contribute for the operation and maintenance of future facilities.

TABLE 38: RESPONDENTS' WILLINGNESS TO PAY FOR FUTURE FACILITIES

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Yes	33	24	57	100.00
2. No	-	-	-	-
TOTAL	33	24	57	100.00

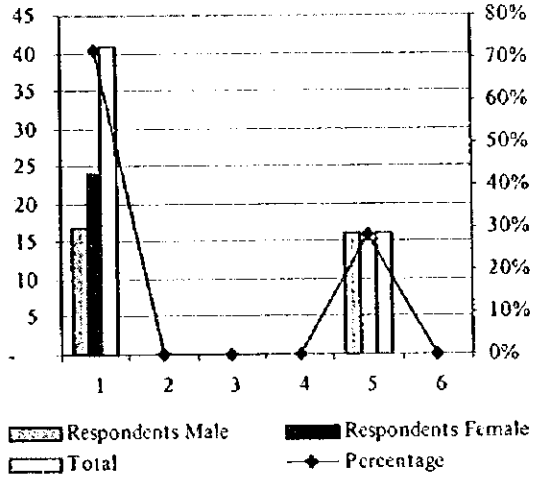


(6) How much are respondents willing to pay?

Of those who are willing to pay, the majority claimed they can only pay from ₱2.00 to ₱5.00. Sixteen male respondents agreed to pay water fees ranging from ₱31.00 to ₱40.00.

TABLE 39: AMOUNT RESPONDENTS ARE WILLING TO PAY

RESPONSE	RESPONDENTS		T	%
	M	F		
1. ₱2.00 - ₱5.00	17	24	41	71.90
2. ₱6.00 - ₱10.00	-	-	-	-
3. ₱11.00 - ₱20.00	-	-	-	-
4. ₱21.00 - ₱30.00	-	-	-	-
5. ₱31.00 - ₱40.00	16	-	16	28.10
6. ₱41.00 - ₱50.00	-	-	-	-
TOTAL	33	24	57	100.00

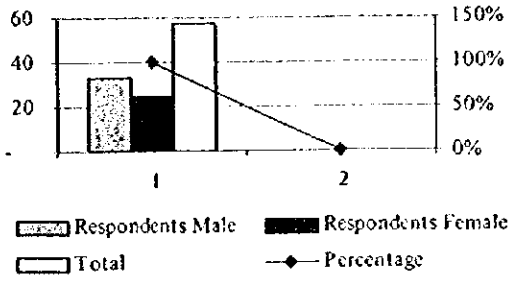


(7) Are you willing to contribute for future projects?

Significantly, all the respondents indicated their willingness to contribute in cash or kind for the construction of WATSAN facilities in their respective barangays.

TABLE 40: WILLINGNESS OF RESPONDENTS TO CONTRIBUTE FOR FUTURE FACILITIES

RESPONSE	RESPONDENTS		T	%
	M	F		
1. Yes	33	24	57	100.00
2. No	-	-	-	0
TOTAL	33	24	57	100.00

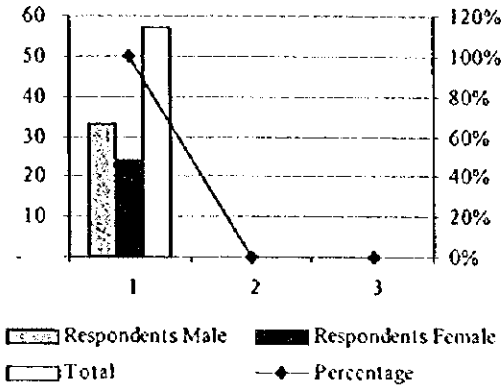


(8) If so, what kind?

All of the respondents preferred to contribute free labor during the construction.

TABLE 41: TYPES OF CONTRIBUTION

RESPONSE	RESPON-DENTS		T	%
	M	F		
1. Labor	33	24	57	100.0
2. Cash	-	-	-	-
3. Materials	-	-	-	-
TOTAL	33	24	57	100.00



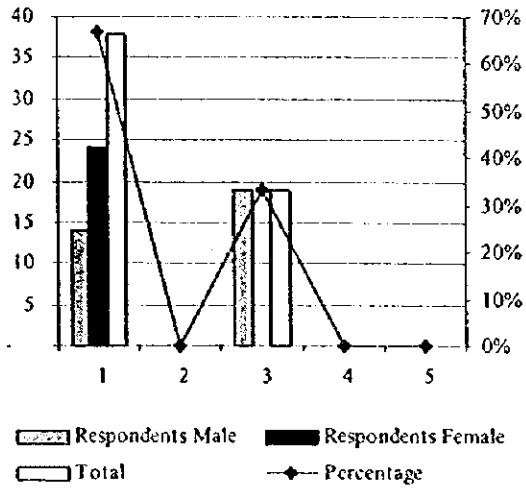
1.9 Health and Sanitation

(1) Type of toilet

All of the female respondents and the majority of male participants (14) indicated that private household toilet which flushes to a septic tank on the site is widely used. The rest of the male interviewees said they use shared flush toilet.

TABLE 42: TYPE OF TOILETS RESPONDENTS USE

RESPONSE	RESPONDENTS			
	M	F	T	%
1. Private HH toilet flushed to septic tank	14	24	38	66.65
2. Private HH pit latrine	-	-	-	0
3. Shared Flushed Toilet	19	-	19	33.35
4. Shared Pit Latrine	-	-	-	0
5. Open outdoor site	-	-	-	0
TOTAL	33	24	57	100.00



(2) Who got sick during the past year? What sickness?

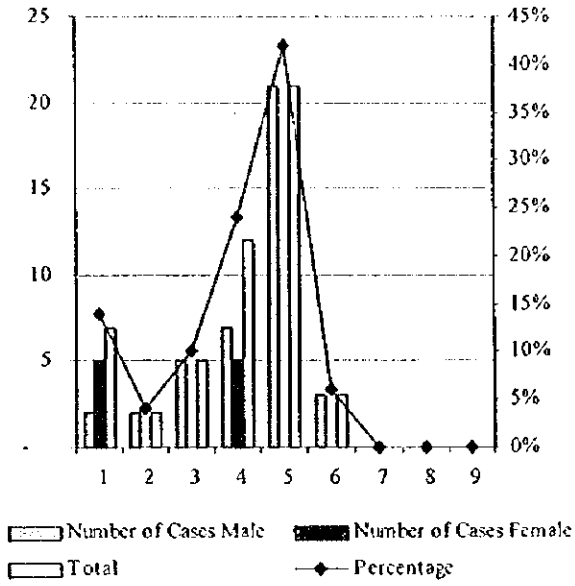
The respondents indicated that in 1997, some 50 persons in their households were afflicted with various water-related diseases. The leading cause of illnesses was kidney troubles, which afflicted 21 persons. The second leading illness was diarrhea, which

afflicted 12 persons. Stomach pain came in third with seven cases; gastroenteritis, five cases; schistosomiasis, 3; and, skin diseases, 3 cases.

The men were most afflicted with these water-related diseases during the year. Most susceptible were the fathers when 31 of them were afflicted with various illnesses, with high cases of kidney trouble, 17; diarrhea, 7; gastroenteritis, 5; and, skin diseases, 2. Seven women also suffered from these diseases, with 4 mothers who suffered with kidney trouble and three daughters from schistosomiasis. Six youngest daughters were afflicted with diarrhea and stomach pain at three cases each.

TABLE 43: WATER-RELATED ILLNESSES

DISEASE	NUMBER OF CASES		T	%
	M	F		
1. Stomach Pain	2	5	7	12.30
2. Skin Diseases	2	-	2	3.50
3. Gastroenteritis	5	-	5	8.75
4. Diarrhea	7	5	12	21.00
5. Kidney trouble	17	4	21	36.85
6. Schistosomiasis	-	3	3	5.25
7. Intestinal Flu	-	-	-	-
8. Malaria	-	-	-	-
9. Typhoid Fever	-	-	-	-
TOTAL	40	10	50	100.00

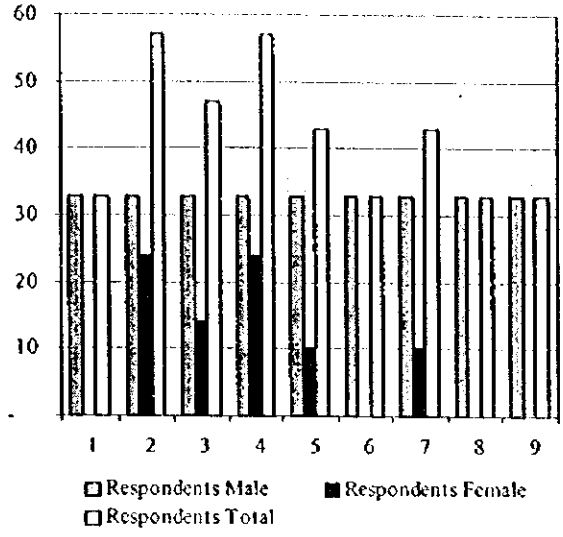


(3) Health and hygiene practices

Most respondents recognized the importance of good health and hygiene practices. They learned about health and sanitation matters mostly from health workers and their relatives and friends. All of the male respondents learned mostly from all the information sources. Most female respondents, on the other hand, got educational information from health workers, television, radio, school and health clinics. (Refer to Table 44).

TABLE 44: WHERE PEOPLE LEARNED HEALTH AND HYGIENE EDUCATION

RESPONSE	RESPONDENTS		
	M	F	T
1. Relatives and friends	33	-	33
2. Health workers/inspectors	33	24	57
3. Radio	33	14	47
4. Television	33	24	57
5. School	33	10	43
6. Newspaper	33	-	33
7. Health clinics	33	10	43
8. Hospitals	33	-	33
9. NGOs	33	-	33



5.8.5 Utilization of NGOs

LIST OF NGOs / CBOs for AGUSAN DEL NORTE

NAME OF NGOs / CBOs	CONTACT PERSON	ADDRESS / TEL. #
1. ADN Federation of P-T Community Association	--	--
2. Barangay Health Workers Federation, ADN	Amado, Avelina L.	Magallanes, Agusan del Norte
3. Philippine Institute of Certified Public Accountants	--	RICPA, Agusan del Norte Chapter
4. Northern Mindanao Foundation, Inc.	Capalit, Ceferino P.	853 Baan Highway, Butuan City
5. Mag. Prawn/Bangus Grower MP Cooperative	Dela Cruz, Virgilio	Magallanes, Agusan del Norte
6. Cooperative Bank of ADN-BC, Inc.	Fabe, Roger	Montilla, Blvd , Butuan City
7. Sta. Ines Community Multi-Purpose Tra.	Gerong, Socrates E.	Magallanes, Agusan del Norte
8. FORWARD Filipina	Hontiveros, Edna S.	115 Montilla Blvd , Butuan City
9. Associate for Integral Development (AID)	Hontiveros, Greg	UCCP Bldg , R. Calo St , B.C.
10. FARMDEV	Lim, Necitas R.	Doongan, Butuan City
11. Federation of BC & ADN Cooperative (FEDBAC)	Malicy, Romeo B.	020 Lagnada St , Butuan City
12. TRICOM Agro-Industry MP Cooperative	Manduminda, Balbino	Casiklan, Las Nieves, ADN
13. Santiago Multi-Purpose Cooperative	Morado, Benefrido M.	Santiago, Agusan del Norte
14. Tribal Communities Association of the Philippines	Morado, Ebanta, Jr.	Santiago, Agusan del Norte
15. ADN Federation of People's Economic Council	Namocatcat, Nolie	Gloria Bldg., R. Calo St., B.C.
16. SCP Construction	Pascual, Sergio C.	Doongan, Road, Butuan City
17. Union sa Cagmayang Mananagat	Pendijito, William	Sto. Rosario, Magallanes, ADN
18. United Boholanos, Inc. (UBI)	Salcedo, Pedro V.	Cabadbaran, Agusan del Norte
19. Barangay Health Workers Federation, ADN	Serrano, Editha C.	Santiago, Agusan del Norte
20. Cabadbaran, Community Multi-Purpose Cooperative	Tapales, Ernesto G.	Cabadbaran, Agusan del Norte
21. ADN Transport Service Cooperative, Inc.	Tocmo, Teodosio, Sr.	212-O.R. Calo St., Butuan City
22. Diwata Pacific Economic Society Foundation	Vidal, Victoriano	Felipe Ext , Village B.C.
23. Cooperative Rural Bank of BC & ADN	Villanueva, Diosdado E.	Montilla Blvd , Butuan City
24. Integrated Bar of the Philippines	Rosales, Benjamin S.	--

5.8.6 Existing Community Development Process

Detailed Typical CD Process in Agusan del Sur

1) **Make courtesy calls.** Courtesy calls are made to barangay/sitio officials prior to the conduct of meetings with the community. Then, a series of meetings and community assemblies are done where the WATSAN program is introduced, its significance and impact taken up and the importance of organizing promoted. This is followed by a more detailed presentation/orientation of the project -- its concept, features, history, stakeholders, and the CO process utilized. Depending on the level of community awareness regarding the program/project, two or three meetings/assemblies are needed before doing the baseline survey.

2) **Preparation of profile (secondary information) and survey forms.**

(a) ***General information.*** Distance from barangay to poblacion, mode of travel, time and fare; no. of sitio/purok; dominant ethnic groups, common occupation of residents; demographic data (no. of household, male and female population) by sitio/purok, no. of dwelling structures, school buildings, other buildings, availability of electricity by sitio/purok.

(b) ***Barangay WATSAN status.*** Existing water supply systems, by sitio/purok, by type and service level, no. of facilities (functioning), potability, no. of HH served, who installed, who operates, user charges, if any; HHs toilet facilities, by sitio/purok, no. of HHs with private toilets by type, no. of HH using shared toilets by type, no. of HH without toilets; no. of community waste disposal systems by sitio/purok, by method and wastewater system; no. of reported morbidity and mortality cases of water-borne/contact/vector-borne diseases of barangay residents.

c) ***WATSAN related programs and projects in the barangay.*** Existing WATSAN programs/project by type of activity, implementing organization/agency, sponsoring funding agency, specify years when operated in barangay, name of community association organized, if any; past WATSAN programs/projects by type of activity, implementing organization/agency, sponsoring funding agency, specify years when operated, name of community association organized, if any; Community organizations in the barangay, watsan related groups/organization and other community organizations, its name of group/organization, sitios where members are, sponsoring agencies, year organized and status; other barangay facilities.

(d) ***Resources for barangay water supply and toilet facilities fabrication.*** Brief description of water sources-undeveloped springs, streams and other water sources which can be tapped and developed, sources which can be improved including estimated distance to center of HHs to be served, availability of water, estimated flows during dry and wet seasons; water and well depths by sitio/purok, by season; availability of construction materials for water supply and toilet if available for free at barangay or at hardware/other stores, its sources, name and address of store, materials available, distance from barangay and means of transport for materials; sources of pumps and spare parts for pumps – name and address of dealer/store, types of pumps/parts available and distance from barangay; barangay residents with skills in water supply system construction and maintenance, type of skill, no. of persons and remarks; well drillers and water supply contractors who can be tapped for barangay works, their name address, services rendered and charging rates; local fabricators of toilet bowls, their name, location, type/description of toilet bowl.

3. **Identify of community volunteers.** As an initial step in community organizing, a core group of about 7 persons consisting of community leaders is formed. This is the formation of an informal community organization that will assist the CD worker in the preparation of CO strategies, community profiling, identification of project sites, and other work.

4. **Conduct baseline survey.** In the conduct of this survey, focus group discussion was applied and the results validated during barangay spot mapping. The barangay spot map reflects the location of structures (scaled) and different facilities/infrastructure. This serves as a planning tool in the development of WATSAN program for the area.

5. **Inspect/identify project sites and validate projects.** An assembly is called again to present the results of the survey, its profile, assessment and needs. The CD team situates the community, i.e., *where they are now in the sector*. A member of the CD team will then facilitate the surfacing of thoughts from the group in terms of identifying the needs for WATSAN facilities, how project will be implemented in their area, how the facility will be designed and constructed, and how the community perceives their role in the project. In some cases, the community request technical assistance from the Center on site selection of identified areas.

6. **Conduct technical and community consultative meetings** of members and officers together with barangay officials. By this time, the core group has already specific

projects to be implemented. Together with these interim officers, meetings with barangay officials are undertaken to determine local counterpart funding support to the program/project.

7. **Facilitate project implementation.** After funding has been assured, the CD team facilitates the implementation of the project through supervision and monitoring progress of construction. Contribution from the community comes in the form of free labor (*pahina*).

8. **Consolidate BWSA Organization.** The core group formulates the by-laws and policies of the organization and have these ratified by the members. The election of BWSA officers follows. A barangay resolution is passed endorsing the association and submitted to the Municipal Development Council/Sangguniang Bayan for registration/accreditation. Parallel to this activity is the completion of the facility and in most cases, the turn-over of the facility to the newly-organized BWSA, which can coincide with the swearing-in of BWSA officials.

9. **Conduct training on skills and management to BWSA officials** by the Center. The module includes topics on: human resource development (self and group awareness, communication skills, group facilitation and conducting meeting, effective community work, leadership skills and roles of officers and members, and conflict management); technical (hydrogeology and site selection, well construction and identification of handpump parts, equipment plumbing tools and materials for construction and repairs, hand pump principles of operation, maintenance and approach in trouble shooting, spring development, types of spring, their characteristics and method of developing, operation and maintenance of tank, spring box and distribution line, excreta, liquid and solid disposal system, water related diseases-prevention/control and water quality surveillance); financial management; project planning management; and action planning.

10. **Undertake follow-up activities.** The CD team after the construction of the WATSAN facilities undertakes follow-up activities such as monitoring and evaluation and the provision of recommendations/adjustments on the O&M of the facilities, where needed.

Source: DILG/WATSAN UNDP-PHI as modified by Province of Agusan del Sur

6. PAST FINANCIAL PERFORMANCE IN WATER SUPPLY AND SANITATION

6.2 Past Public Investment

6.2.1 Sources of Local Fund

Table 6.2.1 Statement of Income and Expenditures of Agusan del Norte, 1994-1998

Particulars	1994	1995	1996	1997	1998
1. Buenavista					
Income	17,159,064.88	20,851,062.69	21,796,473.22	33,535,656.00	34,255,115.00
IRA	16,060,842.74	17,945,192.07	19,236,876.28	29,924,856.00	28,241,115.00
Local Revenues	1,098,222.14	2,205,870.62	2,559,596.94	3,611,000.00	6,014,000.00
Borrowings					
Grants and Aids					
Expenditures	16,578,916.38	20,979,875.31	21,473,781.71	29,382,404.26	34,255,000.00
Personal Services (P.S.)	10,278,269.94	13,774,078.92	14,269,573.98	19,886,302.21	24,285,000.00
Maint. & Other Oper. Exp. (MOOE)	2,024,044.33	3,044,874.00	2,749,726.07	7,398,959.05	2,123,000.00
Capital Outlay (CO)		27,975.45	34,500.00	2,097,143.00	2,232,000.00
Others (Non-Office)	3,276,582.09	4,132,947.54	4,419,981.66	-	5,615,000.00
2. Cabadbaran					
Income	18,696,907.71	23,828,655.15	24,165,938.95	34,974,529.05	35,969,520.00
IRA	13,970,825.00	16,372,004.96	18,004,465.28	28,875,641.00	26,025,429.00
Local Revenues	4,726,082.71	5,449,650.19	6,161,406.63	6,098,885.05	9,944,091.00
Borrowings					
Grants and Aids					
Expenditures	18,799,262.61	21,947,030.01	22,334,292.92	29,382,404.26	35,969,420.00
Personal Services (P.S.)	10,979,742.03	12,840,367.43	14,472,026.14	19,886,302.21	26,311,546.00
Maint. & Other Oper. Exp. (MOOE)	4,705,724.74	4,387,667.26	4,815,038.40	7,398,959.05	9,425,874.00
Capital Outlay (CO)	155,983.00	1,001,868.75	-	2,097,143.00	-
Others (Non-Office)	2,927,812.84	3,721,133.52	4,047,228.38	-	232,000.00
3. Carmen					
Income	7,502,122.37	8,333,857.39	10,364,918.96	15,365,091.06	17,663,050.00
IRA	7,455,223.00	7,920,018.03	9,839,398.36	12,245,446.00	13,858,675.00
Local Revenues	346,899.37	413,839.36	525,520.60	3,119,645.06	3,764,375.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	6,501,623.35	8,471,548.37	9,560,559.25	11,830,212.27	14,892,675.00
Personal Services (P.S.)	3,984,282.88	4,658,602.88	5,496,633.46	8,359,601.34	9,219,245.45
Maint. & Other Oper. Exp. (MOOE)	683,656.52	1,045,844.48	1,220,962.61	3,136,543.02	4,036,194.55
Capital Outlay (CO)	241,957.72	290,234.05	63,200.00	334,067.91	1,636,735.00
Others (Non-Office)	1,591,226.23	2,476,867.03	2,729,758.18	-	-
4. Jabonga					
Income	10,403,465.25	12,032,973.30	12,410,438.90	15,487,969.00	21,794,594.00
IRA	9,961,623.00	10,959,823.44	11,750,524.00	14,854,969.00	16,858,594.00
Local Revenues	441,842.25	1,073,149.86	659,914.90	633,000.00	4,936,000.00
Borrowings					
Grants and Aids					
Expenditures	10,332,099.01	11,445,518.96	12,360,968.39	15,484,300.00	21,793,000.00
Personal Services (P.S.)	5,887,434.50	6,174,244.21	7,621,342.83	9,066,300.00	12,394,000.00
Maint. & Other Oper. Exp. (MOOE)	2,045,333.71	2,463,258.30	2,748,190.00	3,887,000.00	4,180,000.00
Capital Outlay (CO)	-	-	-	2,421,000.00	4,019,000.00
Others (Non-Office)	2,399,330.80	2,911,016.65	1,991,435.56	110,000.00	1,240,000.00
5. Kitcharao					
Income	8,079,500.92	12,299,196.57	9,544,914.88	12,160,418.01	14,274,595.00
IRA	7,415,487.00	9,174,034.80	8,785,881.20	11,202,364.00	12,674,595.00
Local Revenues	664,013.92	3,125,161.77	759,093.68	958,054.01	1,600,000.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	8,079,450.06	10,190,020.01	9,876,274.65	12,082,133.85	14,274,595.00
Personal Services (P.S.)	4,757,588.66	5,712,263.91	6,160,110.87	7,088,209.13	9,472,139.86
Maint. & Other Oper. Exp. (MOOE)	1,474,959.20	1,275,407.77	1,243,274.85	2,834,637.35	2,567,476.14
Capital Outlay (CO)	-	-	-	796,132.70	1,181,519.00
Others (Non-Office)	1,846,902.20	4,202,348.30	2,472,888.90	1,353,142.70	1,353,460.00
6. Las Nieves					
Income	13,743,553.15	15,743,239.23	16,086,237.75	21,405,393.37	25,922,515.50
IRA	13,277,339.00	14,352,294.16	15,398,614.00	20,680,159.00	23,549,531.00
Local Revenues	455,214.15	1,390,945.07	687,623.75	725,234.37	2,372,987.50
Borrowings	-	-	-	-	-
Grants and Aids	11,000.00	-	-	-	-
Expenditures	12,921,636.42	15,132,898.33	16,491,764.10	21,270,316.00	25,907,112.64
Personal Services (P.S.)	6,256,814.89	7,409,673.55	8,402,834.85	13,958,532.66	15,461,266.09
Maint. & Other Oper. Exp. (MOOE)	1,770,804.19	2,108,383.80	2,056,765.34	6,172,404.47	3,722,389.93
Capital Outlay (CO)	139,324.97	182,698.00	177,720.20	1,635,378.87	4,781,406.20
Others (Non-Office)	4,715,292.37	5,432,156.98	5,854,423.71	-	1,842,050.42
7. Magallanes					
Income	13,090,218.70	11,906,830.48	13,220,073.37	15,268,855.74	17,950,000.00
IRA	6,187,992.00	6,892,595.00	7,472,915.81	9,537,436.00	10,768,025.00
Local Revenues	4,902,226.70	5,014,235.48	5,747,157.56	5,731,419.74	7,181,975.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	11,015,458.58	11,495,834.03	13,532,972.47	14,542,184.37	18,150,000.00
Personal Services (P.S.)	6,364,664.83	6,221,487.36	8,322,682.04	10,303,043.14	12,746,023.68
Maint. & Other Oper. Exp. (MOOE)	1,630,447.76	2,272,778.32	1,734,488.14	1,025,916.61	790,412.58
Capital Outlay (CO)	658,935.32	133,199.53	434,500.00	418,650.00	300,000.00
Others (Non-Office)	2,361,410.69	2,868,238.86	3,041,109.29	2,794,575.22	4,313,563.74
8. Nasipit					
Income	15,625,315.76	16,605,850.65	19,470,174.00	24,716,866.00	28,500,000.00
IRA	10,738,080.00	11,899,439.00	12,873,420.00	15,746,866.00	17,821,000.00
Local Revenues	4,887,238.76	4,706,411.65	6,596,754.00	8,970,000.00	10,679,000.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	14,439,597.45	15,097,813.63	18,230,791.58	21,174,000.00	28,500,000.00
Personal Services (P.S.)	9,419,813.16	12,539,658.38	13,079,020.10	15,676,000.00	20,958,000.00
Maint. & Other Oper. Exp. (MOOE)	2,397,927.69	3,197,498.24	2,431,195.00	2,946,000.00	1,964,000.00
Capital Outlay (CO)	756,298.71	377,185.87	224,958.00	384,000.00	49,000.00
Others (Non-Office)	1,865,547.69	1,983,268.13	2,495,568.49	2,168,000.00	5,499,000.00
9. R.T.R.					
Income	6,319,219.41	7,282,626.78	7,775,259.70	10,102,984.00	10,742,307.00
IRA	5,603,232.00	6,201,054.42	6,693,556.40	8,865,984.00	10,020,307.00
Local Revenues	715,978.41	1,081,572.36	1,081,723.30	1,237,000.00	1,727,000.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	6,627,584.15	6,958,456.10	7,812,198.37	9,636,000.00	11,747,000.00
Personal Services (P.S.)	4,775,154.43	4,972,289.15	5,677,019.36	6,503,000.00	7,814,000.00
Maint. & Other Oper. Exp. (MOOE)	545,398.15	749,663.73	846,001.95	1,304,000.00	1,182,000.00
Capital Outlay (CO)	337,527.00	-	-	1,654,000.00	33,000.00
Others (Non-Office)	1,169,504.57	1,245,503.22	1,289,177.06	175,000.00	2,718,000.00
10. Santiago					
Income	9,302,810.27	10,122,006.91	9,938,260.94	14,725,069.00	19,334,079.00
IRA	8,338,371.00	9,042,143.00	8,969,324.00	13,287,142.00	15,121,551.00
Local Revenues	964,439.27	1,079,863.91	972,936.94	1,437,927.00	4,612,528.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	9,859,759.51	10,224,663.85	9,533,484.06	14,043,488.42	19,721,422.35
Personal Services (P.S.)	4,781,629.89	6,268,600.00	6,188,322.70	8,226,753.47	10,332,119.70
Maint. & Other Oper. Exp. (MOOE)	2,432,455.71	2,043,500.00	2,426,007.76	5,011,698.95	8,509,812.15
Capital Outlay (CO)	238,000.00	-	-	805,036.00	699,500.00
Others (Non-Office)	1,696,674.00	1,892,563.85	1,319,153.60	-	-
11. Tubay					
Income	7,796,431.00	8,729,955.34	9,491,968.58	18,868,060.00	16,883,822.60
IRA	7,341,166.00	8,113,296.00	8,739,320.27	18,173,060.00	12,643,822.60
Local Revenues	455,265.00	616,159.34	742,648.31	690,000.00	4,240,000.00
Borrowings	-	-	-	-	-
Grants and Aids	-	-	-	-	-
Expenditures	8,115,933.83	8,714,560.99	10,125,229.97	11,404,950.00	16,830,000.00
Personal Services (P.S.)	4,588,986.83	4,842,590.43	5,046,182.29	6,580,000.00	10,175,000.00
Maint. & Other Oper. Exp. (MOOE)	1,035,869.77	1,195,392.53	1,608,378.32	4,796,020.00	6,605,000.00
Capital Outlay (CO)	28,850.00	51,345.00	22,500.00	28,930.00	50,000.00
Others (Non-Office)	2,462,227.23	2,625,193.03	3,448,169.37	-	-

Source: Municipalities and PPDO

Table 6.2.2 Past Internal Revenue Allotment to Municipalities from Central Government

	1994	1995	1996	1997	1998
1. IRA to all municipalities (National total)	16,325,288,074	18,768,952,000	19,607,715,553	24,849,000,000	28,245,815,434
2. IRA to municiaplities in Agusan del Norte					
Total	105,635,895	116,014,680	128,419,358	165,371,912	188,123,389
Buenavista	15,881,087	17,945,191	19,236,876	24,924,856	28,741,860
Cabadbaran	13,970,825	16,361,099	18,004,465	22,875,644	26,025,429
Carmen	7,155,223	7,920,028	9,839,398	12,245,446	13,898,675
Jabonga	9,961,623	10,959,820	11,750,528	14,854,965	16,858,594
Kitcharao	7,415,487	6,174,032	8,785,883	11,202,364	12,674,595
Las Nieves	13,269,231	14,472,394	15,398,610	20,680,159	23,549,531
Magallanes	6,187,992	6,892,595	7,472,912	9,517,426	10,768,025
Nasipit	10,690,118	11,999,439	12,873,420	15,746,866	17,821,000
Remedios T. Romualdez	5,603,232	6,201,052	6,693,538	8,865,984	10,020,307
Santiago	8,159,911	8,975,055	9,624,409	13,287,142	15,121,551
Tubay	7,341,166	8,113,975	8,739,319	11,171,060	12,643,822
3. Share (%) in national total by municipality					
Total	0.6471	0.6181	0.6549	0.6655	0.6660
Buenavista	0.0973	0.0956	0.0981	0.1003	0.1018
Cabadbaran	0.0856	0.0872	0.0918	0.0921	0.0921
Carmen	0.0438	0.0422	0.0502	0.0493	0.0492
Jabonga	0.0610	0.0584	0.0599	0.0598	0.0597
Kitcharao	0.0454	0.0329	0.0448	0.0451	0.0449
Las Nieves	0.0813	0.0771	0.0785	0.0832	0.0834
Magallanes	0.0379	0.0367	0.0381	0.0383	0.0381
Nasipit	0.0655	0.0639	0.0657	0.0634	0.0631
Remedios T. Romualdez	0.0343	0.0330	0.0341	0.0357	0.0355
Santiago	0.0500	0.0478	0.0491	0.0535	0.0535
Tubay	0.0450	0.0432	0.0446	0.0450	0.0448

Sources: (1) Department of Budget and Management and (2) Bureau of Local Government Finance.

7. WATER SOURCE DEVELOPMENT

7.3 Groundwater Sources

7.3.2 Groundwater Availability in the Province

(1) Major Information and References

The Groundwater Availability Map was prepared using the following information and reference (detailed list of reference is presented in Table 7.3.1, Data Report).

- Administrative and Topographical Maps of the Province published by NAMRIA with scale of 1:150,000 and 1:50,000, respectively.
- Geological Map of the Philippines published by BMGS with a scale of 1:1,000,000.
- Water Resource Investigation conducted by NWRB, 1986.
- Well Inventory Database prepared by NWRB, LWUA, and DPWH.
- Well Inventory Database in the province.
- General information on groundwater condition by DPWH-DEO and PPDO.
- Well Log Data by DPWH-DEO.
- Water source information by Water Districts.

(2) Approach and Methodology

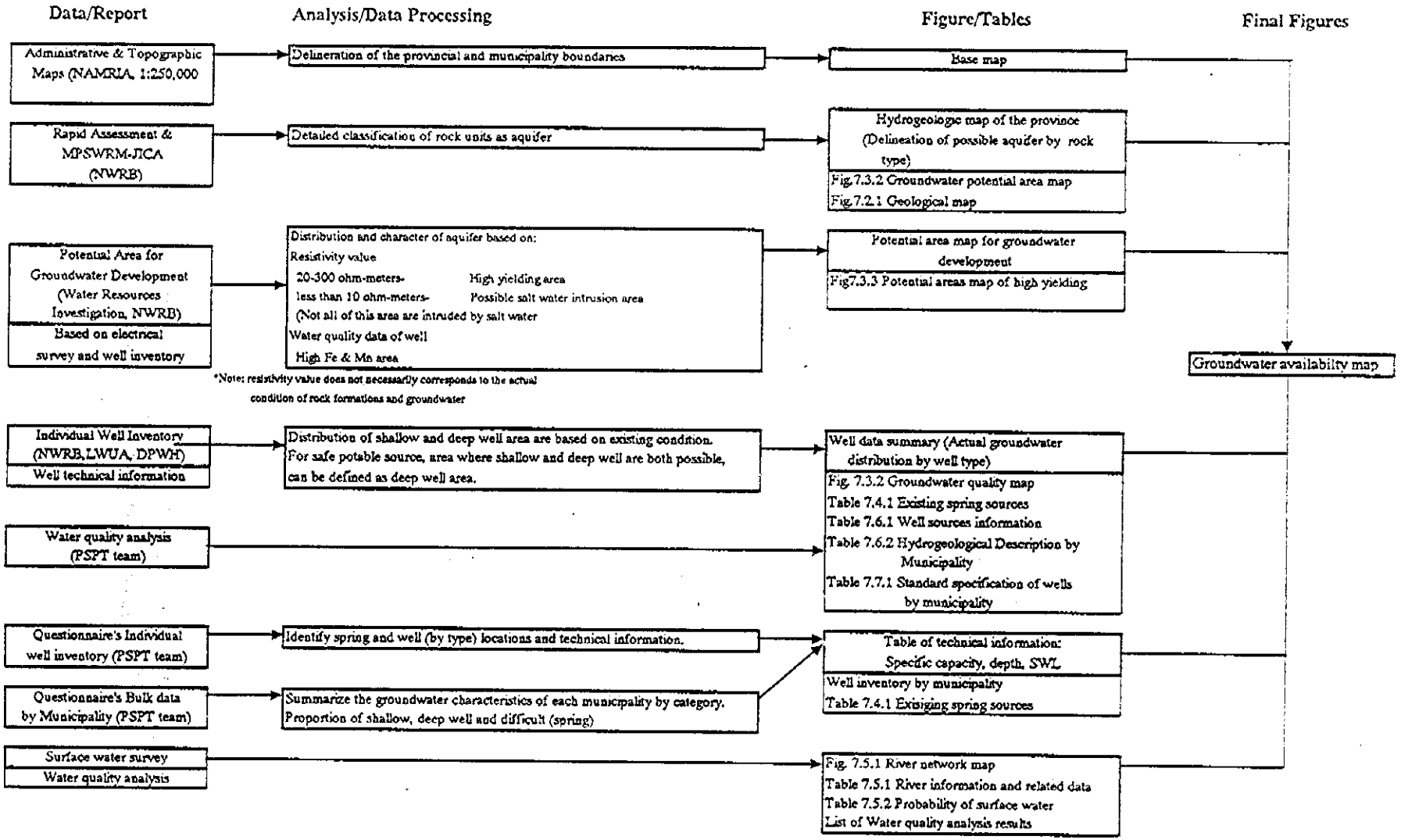
The procedure in preparing the Groundwater Availability Map is explained below with work flow depicted in Figure 7.3.1.

1) Prepare a base map with a scale of 1:250,000. The topographical map of NAMRIA (1:250,000) was used as a reference map. Basic information including rivers and provincial and municipal boundaries are indicated in the prepared base map.

2) The groundwater potential areas, based on the geology of the province, are delineated on the base map. The Recent alluvial and/or beach deposits, Pliocene-Quaternary sedimentary formation (clay, silt, sand and gravel) and Pliocene-Quaternary volcanic rock units (pyroclastics, debris flow, and tuff) are regarded as possible aquifers considering their high porosity and permeability.

Boundaries between groundwater development potential areas and difficult areas were defined and delineated as presented in Figure 7.3.2.

Figure 7.3.1 WORK FLOW OF GROUNDWATER AVAILABILITY MAP



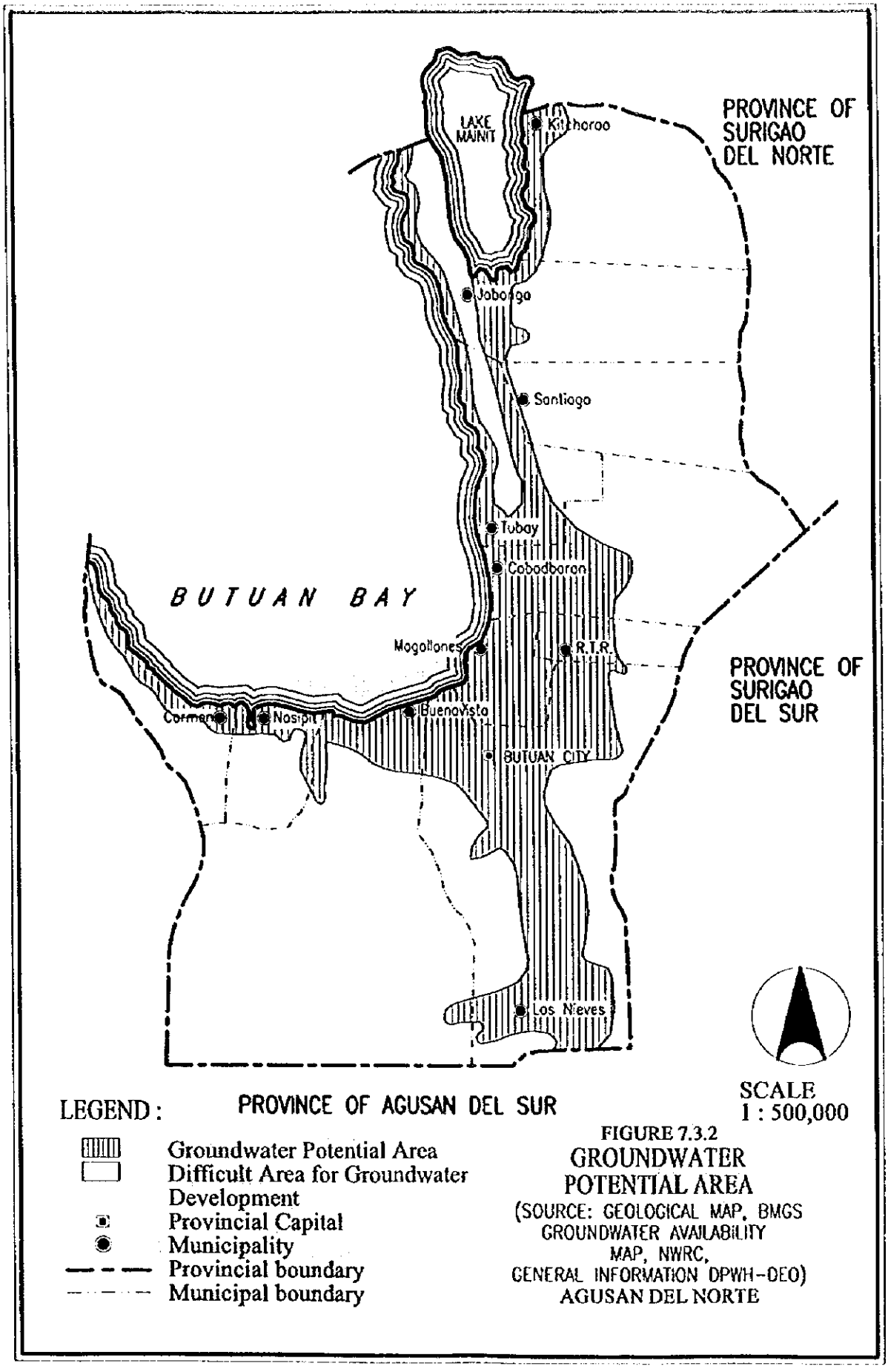


FIGURE 7.3.2
GROUNDWATER POTENTIAL AREA
(SOURCE: GEOLOGICAL MAP, BMGS
GROUNDWATER AVAILABILITY MAP, NWRC,
GENERAL INFORMATION DPWH-DEO)
AGUSAN DEL NORTE

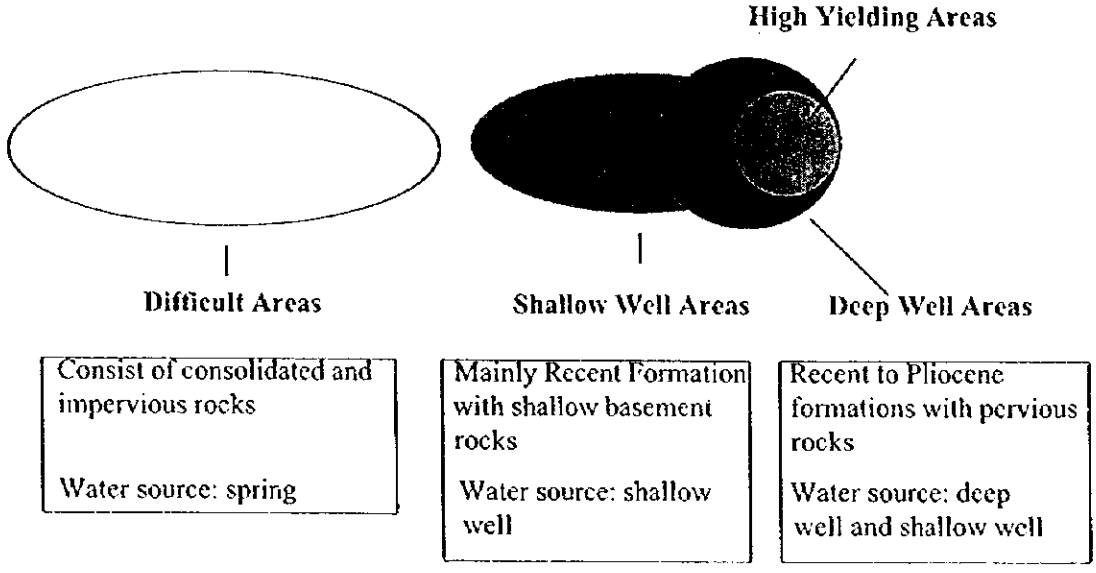
DISK NAME : AGUSAN-DELNORTE(DISK1)
FILENAME : AGUSAN-DELNORTE(GPA)

3) Areas with potential high yielding aquifer in the Water Resources Investigation of NWRB, are reflected in the defined groundwater potential areas.

Based on the results of electric resistivity survey of the above investigation, resistivity values from 20 to 210 ohm-meter indicate a potential high yielding formation. Values less than 10 ohm-meter suggest clayey layer. Figure 7.3.3 shows the boundaries of areas with high and low yielding aquifers.

4) Delineate shallow and deep well areas based on well database of NWRB and DPWH-central office, well inventory of DPWH-DEO (refer to Table 7.3.1, Data Report) and rock distribution. Figure 7.3.4 presents the categorization in terms of groundwater utilization.

Figure 7.3.4 Area Category in Groundwater Utilization



Shallow well areas are defined on the following basis:

(a) Predominance of serviceable shallow wells and presence of deep wells with water quality problem and/or low yielding aquifers.

(b) Occurrence of impervious rocks beneath the Recent formation at shallow depth.

5) Based on the information provided by NWRB's well inventory and the data obtained through the questionnaires, well specifications for each municipality are established

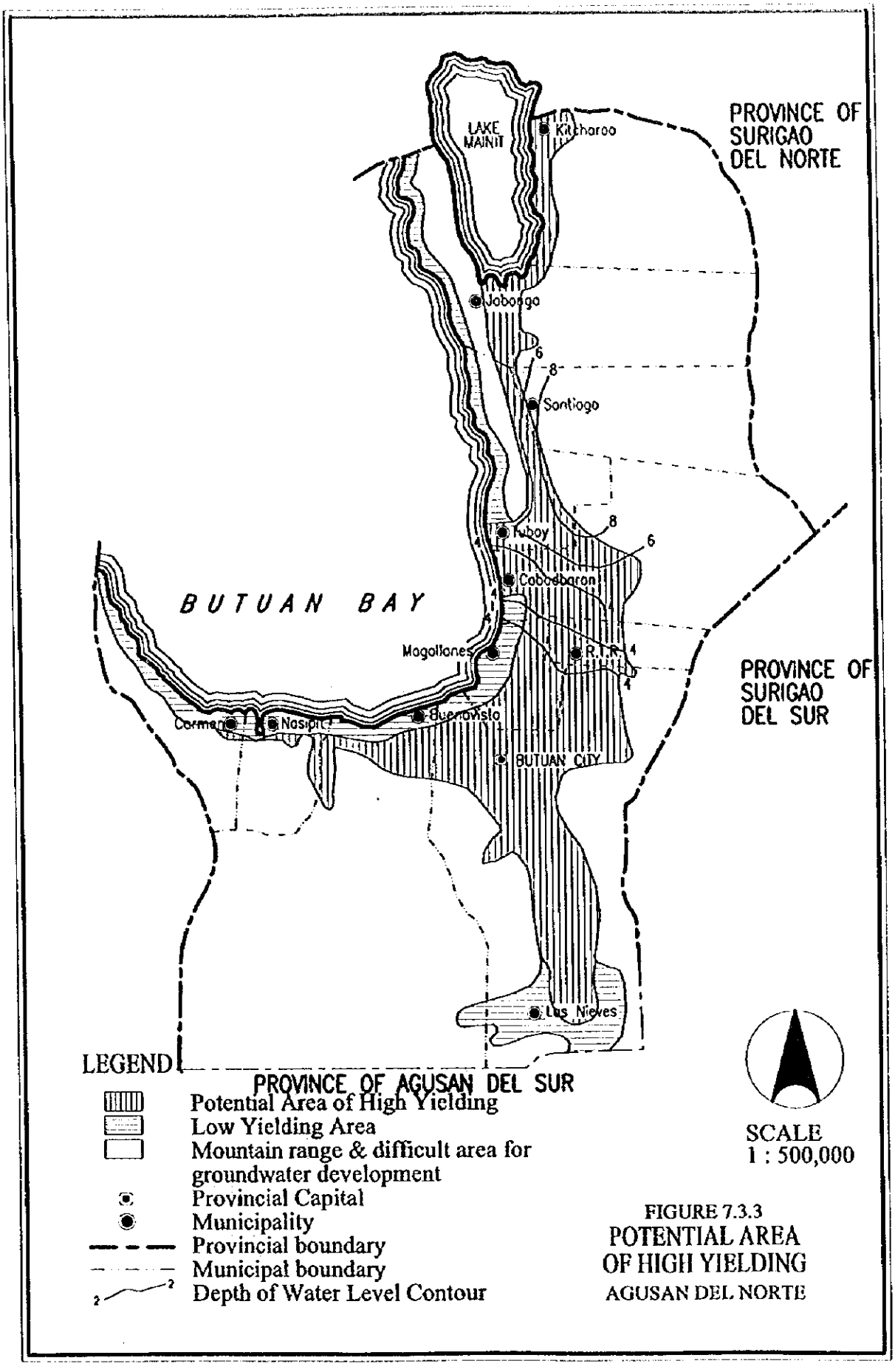


FIGURE 7.3.3
POTENTIAL AREA OF HIGH YIELDING
AGUSAN DEL NORTE

DISK NAME : AGUSAN-DELNORTE(DISK2)
FILENAME : AGUSAN-DELNORTE(PAINT)

as shown in the map. These specifications are used as references in evaluating the groundwater availability in each locality. Individual well locations with technical information are presented in Figure 7.6.1, Data Report.

(3) Future updating and utilization of the map

For future updating of the map, the following procedure shall be employed.

1) Referring to the results of any supplementary water sources investigation by various agencies, re-define the potential area for groundwater development by applying the aforementioned procedures.

2) Update the provincial database using the questionnaire made for the study to make necessary revision of the delineated boundaries of groundwater categories.

7.4 Spring Sources

The numbers and discharge of developed and untapped springs by municipality are shown in Table 7.4.1. The data are derived from the information obtained through the questionnaires and Table 7.1.1 Water Source Information, Data Report.

Table 7.4.1 Existing Spring Sources

Municipality	Developed Spring		Untapped Spring		
	Number	Discharge (l/sec)	Discharge (l/sec)		
			Number	Ave.	Range
Kitcharao	3	< 2.8	3	1.11	0.75 – 1.86
	1	> 2.8			
Jabonga	14	< 2.8			
	4	> 2.8			
Santiago	7	< 2.8			
	4	> 2.8			
Tubay	19	< 2.8	6	N.A.	N.A.
Cabadbaran	2	< 2.8	1	1.00	1.00
	4	> 2.8			
R.T.R.	5	< 2.8	3	0.53	0.13-1.94

Note: N.A. Data not available

Municipality	Developed Spring		Untapped Spring		
	Number	Discharge (l/sec)	Discharge (l/sec)		
			Number	Ave.	Range
Buenavista	2	< 2.8	4	1.00	0.83
	2	> 2.8			
Naspit	5	< 2.8	1	N.A.	N.A.
	3	> 2.8			
Carmen	3	< 2.8			
	1	> 2.8			
Las Nieves	12	< 2.8			
TOTAL	83		18		

Note: N.A. Data not available

7.5 Surface Water Sources

The major rivers in the province were selected to evaluate their potential as water supply source to meet the future water needs of the province. The following criteria were adopted for the selection:

- rivers currently utilized for domestic water supply,
- rivers, which have gauging stations, and
- rivers with watershed of 100 sq.km or more.

Based on the above criteria, the selected major rivers were the Agusan River, the Cabadbaran River, the Kalinawan River, the Linugos River and the Tubay River. The Agusan River has several tributaries as shown in Table 7.5.1. The Agusan River originates from other provinces such as Misamis Oriental, Bukidnon, Davao del Norte, and Agusan del Sur.

The gauging stations in the province are located at the Agusan River, the Sanghan River and the Kalinawan River, as shown in Figure 7.5.1. The runoff records are obtained from the "Philippine Water Resources Summary Data" prepared by NWRC in 1980. Data from the gauging stations including the present uses (water rights) from the major rivers in the respective municipalities are summarized in Table 7.5.1.

(1) Surface Water Utilization/Water Rights

As seen in Table 7.5.1, the present water uses in the watershed of the major rivers total

Table 7.5.1 Gauging Station & River Water Use by Major River Basins

River Basin		Information from Gauging Station						Surface Water Use (Water Rights) in Watershed				
Major River	Stream & Main Systems	Drainage*1 sq.km	Location No. in Figure 7.5.1	River Flow Rate (Q: cum/sec) Peak Qp	Max. Qdx	Mini. Qdn	Data Period	Municipality in watershed	Domestic cum/sec	Industrial cum/sec	Irrigation cum/sec	Others*3 cum/sec
Agusan	Ojot	No Existing Gauging Station						(Misamis Oriental)*5	0.00	0.00	0.44	0.00
								(Bukidnon)*5	0.00	0.00	2.51	0.00
								Las Nieves	0.00	0.00	0.66	0.00
	Bugabos	No Existing Gauging Station						Buenavista	0.00	0.00	0.29	0.01
								Butuan City	0.00	0.00	1.79	0.00
	Sanghan	60.0	(3): R.T.R. Proper	45.50	35.94	1.03	1950-'53	R.T. Romualdez	NR*4	NR*4	NR*4	NR*4
								Cabadbaran	0.00	0.00	1.04	0.00
								Magallanes	NR*4	NR*4	NR*4	NR*4
	Agusan Main	11,677.0	(2); Butuan City Proper	NA*2	NA*2	NA*2	1957-'70	(Davao del Norte)*5	0.14	0.40	8.46	0.00
								(Agusan del Sur)*5	0.03	0.00	16.87	0.00
								Las Nieves	0.00	0.00	0.15	0.00
								Butuan City	0.00	0.00	18.13	0.00
								Magallanes	NR*4	NR*4	NR*4	NR*4
Cabadbaran		No Existing Gauging Station						Cabadbaran	0.00	0.00	2.43	0.00
								Santiago	0.00	0.00	0.02	0.00
Kalinawan		482.0	(1): near Bangonay	203.30	184.05	20.30	1968-'70	Jabonga	0.00	0.00	0.37	0.00
								Kitcharao	0.00	0.00	0.05	0.00
Linugos		No Existing Gauging Station						Nasipit	0.00	0.03	0.14	0.01
Tubay		No Existing Gauging Station						Tubay	NR*4	NR*4	NR*4	NR*4
								Jabonga	0.00	0.00	0.03	0.00

Source; Philippine Water Resources Summary Data, established January 1980 by NWRC

Notes;
- Drainage*1 : Watershed Area at Gauging Station
- NA*2 : Recorded River Gauge Hight only
- Qp : Peak Discharge of Daily Maximum Discharge
- Qdx : Maximum Daily Discharge of Weighted Daily Discharge
- Qdn : Minimum Daily Discharge of Weighted Daily Discharge
- Others*3 : Including Livestock, Recreation & Fisheries
- NR*4 : Surface water utilization was not registered in NWRB Database, as of March 1997.
- (Province)*5 : Out of Applicable Area

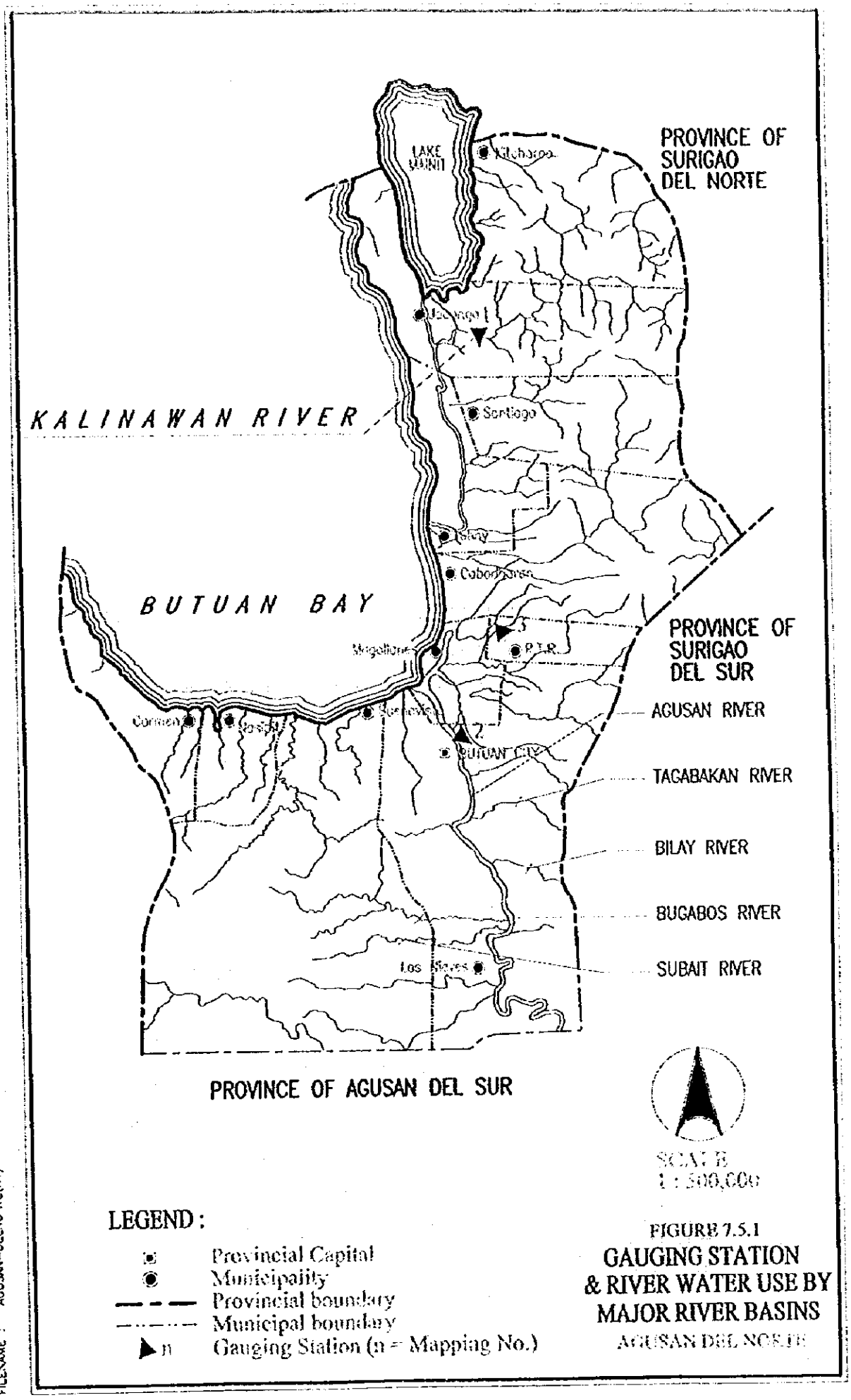


FIGURE 7.5.1
GAUGING STATION & RIVER WATER USE BY MAJOR RIVER BASINS
AGUSAN DEL NORTE

DISK NAME : AGUSAN-DELNORTE(DISK1)
FILENAME : AGUSAN-DELNORTE(A4)

53.39 cu.m/sec. Of this total use, the water rights of 24.54 cu.m/sec are registered in the province. While, 28.85 cu.m/sec from the Agusan River are used in the adjoining provinces. Additionally, 6.59 cu.m/sec from other rivers are utilized in the province. The ratio of surface water use for domestic water supply in the major river basins is only 0.3%, including other provinces' uses.

(2) River Flow Analysis

The flow duration curves, derived from the available runoff records, are shown in Figure 7.5.2. Also, for the Agusan River duration curve, the specific discharge at the Monkao Gauging Station in the province of Davao del Norte was added for comparison.

The stream flow, maintenance flow, diversion flow and return flow are usually used to estimate the exploitable surface water potential. In this study, the stream flow was considered as flow potential for domestic use while the diversion flow value based on water rights allocation as surface water use. However, Detailed study on the return flow has not been performed due to the difficulties in investigating on relating hydrological parameters within the whole watershed in the province. Therefore, in this study, the return flow was not considered in estimating the river's exploitable potential.

It is generally accepted that to secure the required volume for water supply, each water use sector adopts the different return period. Usually, the dependability of domestic water supply is taken to be 90% or high (10-year or longer return-period) of the whole hydrologic period.

In determining the river maintenance flow, such factors as runoff characteristics, navigation, fishing, picturesque scenery, salt water intrusion, clogging of river mouth, riparian structures, groundwater table, flora and fauna, and river water quality shall be considered to maintain the normal function of the river. In the Philippines, 10% of the dependable flow of the river is at least assumed as the required minimum maintenance flow. Therefore, the maintenance flow was calculated as the dependable flow for irrigation, which equals to be 80% (5-year return-period) of the whole hydrologic period.

Finally, the exploitable potential of surface water in the province was studied in case of inflow to and outflow from the respective municipalities. The results are summarized in Table 7.5.2. In the said table, Lake Mainit is also considered as a future surface water

Percent of Time (%) (No. in Figure 7.5.1)	Specific Discharge (cum/sec/100sq km)			
	Kalinawan 1	Agusan 2	Sanghan 3	Agusan NWRB M/P
10%	23.66	-	5.24	16.27
20%	18.25	-	3.83	11.96
30%	13.40	-	3.13	9.96
40%	11.54		2.57	8.36
50%	10.13	-	2.37	7.27
60%	8.99	-	2.18	6.31
70%	6.92		2.09	5.37
80%	6.09	-	1.85	4.23
90%	5.52		1.48	2.08
100%	5.24		0.92	0.67
Period of Data Used	1968-1970	-	1950-1968	1979-1983

Source; Philippine Water Resources Summary Data, as of Jan. 1980 by NWRC
Interim Report, Master Plan Study on Water Resources Management, as of Oct. 1997 by NWRB

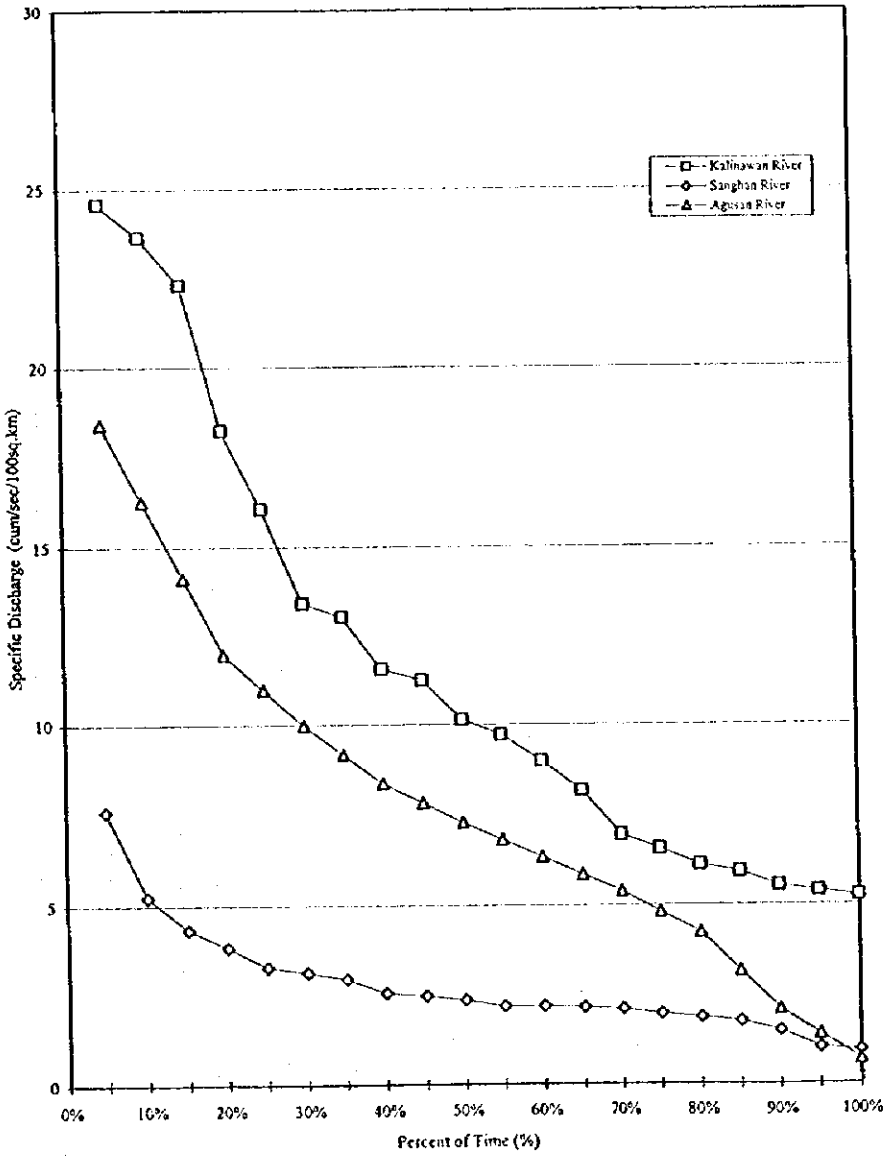


Figure 7.5.2 River Flow Duration Curve

Table 7.5.2 Probability of Surface Water

Surface Water Sources		Related Data						Probability of Surface Water (10-year returen-period)							
				Watershed Area in		Sp. D (return-period)		Inflow to Municipality				Outflow from Municipality (or Lake Mainit)			
Major Surface Wate	Stream & Main Systems	Location Municipality & *other Province*	River Connection	Location (1)	Upstream (2)	10-year (3)	5-year (4)	S/Flow (5) (2)x(3)/100	M/Flow (6) (2)x(4)/100x10%	Use (7)	Potential (8) (5)-(6)-(7)	S/Flow (9) (5)+(1)x(3)/100	M/Flow (10) (6)+(1)x(4)/100x10%	Use (11)	Potential (12) (9)-(10)-(11)
		upstream to down	outlet or inlet	sq.km	sq.km	Q	Q	cu.m/sec	cu.m/sec	cu.m/sec	cu.m/sec	cu.m/sec	cu.m/sec	cu.m/sec	cu.m/sec
Agusan	Ojot System	*Misamis Oriental*		214.2	0.0	2.08	4.23	0.00	0.00	0.00	0.00	4.46	0.91	0.44	3.11
		Bukidnon		318.8	214.2	2.08	4.23	4.46	0.91	0.44	3.11	11.09	2.25	2.95	5.88
		Las Nieves	to Agusan Main	105.1	533.0	2.08	4.23	11.09	2.25	2.95	5.88	13.27	2.70	3.62	6.96
	Bugabos System	Buenavista		70.9	0.0	2.08	4.23	0.00	0.00	0.00	0.00	1.48	0.30	0.29	0.89
		Butuan City	to Agusan Main	47.4	70.9	2.08	4.23	1.48	0.30	0.29	0.89	2.46	0.50	2.08	(0.12)
	Sanghan System	Cabadbaran		132.2	0.0	1.48	1.85	0.00	0.00	0.00	0.00	1.96	0.24	1.06	0.65
		R.T.Romualdez		63.5	132.2	1.48	1.85	1.96	0.24	1.06	0.65	2.90	0.36	1.06	1.47
		Magallanes	to Agusan Main	7.5	195.7	1.48	1.85	2.90	0.36	1.06	1.47	3.01	0.38	1.06	1.57
	Agusan Main	*Davao del Norte*		1,463.4	0.0	2.08	4.23	0.00	0.00	0.00	0.00	30.44	6.19	9.00	15.25
		Agusan del Sur		8,965.5	1,463.4	2.08	4.23	30.44	6.19	9.00	15.25	216.92	44.11	25.90	146.90
		Las Nieves	from Ojot	23.1	10,428.9	2.08	4.23	216.92	44.11	25.90	146.90	230.67	46.91	29.66	154.10
		Butuan City	from Bugabos	478.9	10,451.9	2.08	4.23	230.67	46.91	29.66	154.10	243.10	49.44	46.26	147.40
		Magallanes	from Sanghan	10.0	10,930.9	2.08	4.23	243.10	49.44	46.26	147.40	246.31	49.86	45.23	151.22
Cabadbaran		Santiago		69.0	0.0	5.52	6.09	0.00	0.00	0.00	0.00	3.81	0.42	0.02	3.37
		Cabadbaran		302.1	69.0	5.52	6.09	3.81	0.42	0.02	3.37	20.48	2.26	2.44	15.78
Kalinawan		Kitcharao		44.1	0.0	5.52	6.09	0.00	0.00	0.00	0.00	2.43	0.27	0.05	2.11
		Jabonga		78.8	44.1	5.52	6.09	2.43	0.27	0.05	2.11	6.78	0.75	0.42	5.61
Linugos		Nasipit		28.4	0.0	2.08	4.23	0.00	0.00	0.00	0.00	0.59	0.12	0.18	0.29
Tubay		Jabonga		5.6	0	5.52	6.09	0.00	0.00	0.00	0.00	0.31	0.03	0.03	0.25
		Tubay		107.6	5.6	5.52	6.09	0.31	0.03	0.03	0.25	6.25	0.69	0.03	5.54
Lake Mainit		Jabonga		-	324.1	5.52	6.09	-	-	-	-	17.89	1.97	1.64	14.27
		Tubay		-	324.1	5.52	6.09	-	-	-	-	17.89	1.97	1.64	14.27

Notes; Sp. D (Specific Discharge) was analyzed by montly mean flow records from gauging station.
S/Flow (Stream Flow) was estimated specific diacharge (10-year return-period) multilied by upstream area.
M/Flow (Maintenance Flow) was estimated 10% of river flow in case of 5-year return-period.
Sp.D (10-year or 5-year return-period) without gauging station was adopted by the other analysis result from near gauging station.
Inlet & outlet "Use" (Water Rights) are summed up by NWRB Database, as of March 1997.
Unit Q for Specific Discharge is cu.m/sec/100 sq.km.
S/Flow, M/Flow & Use in final outlet flow of each stream system was added to respective inlet flows' of main system.

source with high potential.

(3) Surface Water Quality

Mining sites exist upstream of several rivers that pass through the province. The locations of the mining sites are shown in Figure 7.5.1. The results of water quality survey are summarized in Table 7.5.1, Data Report. The sampling locations were selected basically at the upstream boundary of the respective municipalities. In the said table, the Class AA and the Class A of the "DENR Water Quality Criteria for Fresh Water" are shown as reference for raw water evaluation. The PNSDW-1994 is also used to evaluate water quality with reference to turbidity and trace elements. The water quality of the selected rivers is classified as "Class A", although the tested parameters are limited.

7.6 Future Development Potential of Water Sources

7.6.1 Groundwater

A well inventory covering all the municipalities show that there are 1,926 existing wells in the province, while 245 wells are recorded in the inventory made by NWRB (See Table 7.1.1 and 7.3.1, Data Report). Despite the smaller number of wells included in NWRB data, they were used in the analysis since they provided technical information. Of the total 245 wells, 120 have complete information: depth, static water level and specific capacity. Data are summarized in Table 7.6.1 Existing Well Sources.

Considering the available well information, the most productive wells are those having depths ranging from 6 m to 20 m and from 20 m to 190 m. The good yielding wells have static water level varying from about 1 m to 10 mbgl and specific capacity of about 0.5 l/sec/m to 1.45 l/sec/m drawdown.

Based on the hydraulic characteristics and distribution of wells in Agusan del Norte, good aquifers occur in the recent sediments that are widely distributed in the central, northern and western portions of the province. In Cabadbaran municipality, about 50 deep wells with a depth of 72 m are in free flowing condition. The Miocene and older rock units are distributed in the mountainous areas that are classified as the difficult area for groundwater development.

Table 7.6.1 Existing Well Sources

Municipality	Type	Number	Depth (m)		SWL (m)		Sp. Cap. (l/sec/m)	
			Ave.	Range	Ave.	Range	Ave.	Range
Buenavista	SW	73	13.51	9.14 - 19.81	2.02	0.91 - 3.35	0.42	0.12 - 0.82
	DW	26	43.66	24.39 - 82.93	3.71	0.30 - 14.33	0.49	0.09 - 1.05
	Total	99	21.43		2.46		0.44	
Butuan City	SW	48	14.02	6.10 - 19.82	2.47	1.22 - 4.57	1.13	0.18 - 2.07
	DW	177	63.26	21.24 - 189.02	3.11	0.30 - 19.81	0.68	0.14 - 4.14
	Total	225	52.76		2.97		0.78	
Cabadbaran	SW	11	11.57	9.67 - 15.24	2.52	0.92 - 4.57	0.13	0.07 - 0.17
	DW	104	51.95	23.17 - 94.51	4.70	0.32 - 23.78	0.82	0.09 - 2.10
	Total	115	48.09		4.49		0.75	
Carmen	SW	78	13.02	7.90 - 18.29	2.59	1.52 - 3.04	0.37	0.33 - 0.41
	DW	18	58.01	24.70 - 153.66	6.97	1.82 - 15.20	1.05	0.10 - 2.77
	Total	96	21.46		3.41		0.50	
Jabonga	SW	4	13.57	9.15 - 17.68	2.21	0.92 - 3.05	0.82	0.41 - 1.03
	DW	3	25.20	21.03 - 28.96	2.44	1.22 - 3.96	0.48	0.48 - 0.48
	Total	7	18.55		2.31		0.67	
Kitcharao	SW	64	12.45	6.00-19.51	2.41	0.06-7.62	1.45	0.08 - 4.13
	DW	12	32.62	21.34 - 45.73	0.84	0.60 - 1.22	0.60	0.28 - 0.84
	Total	76	15.63		2.16		1.32	
Las Nieves	SW	11	14.51	7.31-20.00	4.5	0.61-7.00	0.1	0.06-0.42
	DW	43	35.56	21.33-70.15	5.19	1.22-20.00	0.18	0.05-0.63
	Total	54	31.27		5.05		0.16	
Magallanes	SW	32	8.62	3.00-20.00	2.09	0.6-14.00	0.46	0.05-1.26
	DW	16	56.22	24.39-89.00	4.29	0.9-14.00	0.07	0.05-0.13
	Total	48	24.49		2.82		0.33	
Nasipit	SW	45	12.91	9.15 - 19.82	2.53	0.30 - 8.23	1.04	0.69 - 2.10
	DW	33	42.85	20.42 - 88.11	9.29	0.92 - 19.82	0.54	0.03-3.15
	Total	78	25.58		5.39		0.83	
Tubay	SW	26	15.14	10.98 - 18.53	6.81	2.13 - 13.71	1.04	0.21 - 1.47
	DW	47	46.15	25.06 - 77.74	2.77	0.61 - 6.08	0.38	0.09 - 1.04
	Total	73	35.11		4.21		0.62	
R.T. Romualdez	SW	10	11.59	8.54-18.88	2.98	1.53-5.49	0.35	0.11-1.05
	DW	36	65.41	30.00-107.00	1.89	1.00-5.00	0.38	0.08-1.89
	Total	46	53.71		2.13		0.37	
Santiago	SW	17	12.33	6.00-18.91	4.64	0.91-12.20	0.25	0.07-0.50
	DW	5	29.46	27.4-42.7	11.8	3.05-21.35	0.34	0.34-0.34
	Total	22	16.22		6.27		0.27	
Provincial	SW	419	13.77	6.10 - 19.82	3.09	0.30 - 13.71	0.75	0.07 - 4.13
	DW	520	43.99	20.42 - 189.02	4.22	0.30 - 23.78	0.63	0.04 - 4.14
	Total	939	30.51		3.72		0.68	

Source: NWRB Well Inventory Database

Notes:

* Based on the data from Feasibility Study of WDs, LWUA and DPWH (Questionable data were disregarded)

** Estimated figures from hydrogeological continuity of the aquifer.

*** No related technical information available.

Legend: SWL = Static Water Level SP. Cap = Specific Capacity Ave. = Average

SW = Shallow Well DW = Deep Well

As indicated in Figure 7.3.2 Main Report, salt water intrusion occurred in the shallow wells along the coastal line on the western side of Butuan City and on the northwestern side of the province. On the other hand, groundwater with high iron content is found in shallow wells along the coastal line from Buenavista to Carmen municipalities and in deep wells with depths of 60 m in the northern area of Tubay, part of Magallanes, R.T.R., and Las Nieves municipalities.

As alternative water sources, the untapped springs identified can be developed for future use. These are the most reliable sources of water supply in the mountainous areas considered difficult for well development. The untapped springs are distributed in the eastern mountainous areas of Kicharao, Cabadbaran, Tubay, R.T.R., and in the southern mountainous areas of the hinterlands of Buenavista and Naspit.

The detailed hydrogeological characteristics of each municipality are summarized in Table 7.6.2, while individual well locations with technical information are shown in Figure 7.6.1 Individual Well Location and Specification Map, Data Report.

Table 7.6.2 Hydrogeological Description by Municipality

MUNICIPALITY	EXISTING CONDITIONS																			DATA INTERPRETATION		
	TOPOGRAPHY	GEOLOGIC UNITS (%)					WELL INFORMATION						SPRINGS				GROUND WATER AVAILABILITY (%)			AQUIFER FORMATION	ESTIMATED AQUIFER DEPTH RANGE (mbgl)	OTHERS
							DEPTH (m)		AVE. SWL (mbgl)		MAX./(AVE.) SP. CAP. (l/s/m)		TAPPED		UNTAPPED							
		R	N3	N2	N1	Q	SW	DW	SW	DW	SW	DW	NO.	AVE. Q (l/s)	NO.	AVE. Q (l/s)	SW	DW	DF			
Buenavista	flat to hilly	10	10	75	0	5	9-19	24-82	20	3.71	0.12-0.82 (0.42)	0.09-1.05 (0.49)	8	<2.8	4	1.00	5	20	75	Alluvium/ Plio-Pleis-tocene rocks	3-20	Potential aquifer expected in the alluvial plains. Going deeper may produce a low yieldand saltwater is probable along the shoreline. Location of ground-water well should away from the shoreline.
Butuan City	flat to hilly	60	10	15	0	15	6-19	21-189	2.47	3.11	0.18-2.07 (1.13)	0.14-4.44 (0.68)					0	60	40	Alluvium/ Plio-Pleis-tocene rocks	3-80	Potential aquifer expected in the alluvial plain and low relief hills. Salt water intrusion has already affected the city. Extraction of freshwater should be monitored to prevent the sea water to move farther inland.
Cabadbaran	flat	25	5	5	15	50	9-15	23-94	2.52	4.7	0.07-0.17 (0.13)	0.09-2.10 (0.82)	7	<2.8	1	1.00	0	40	60	Alluvium deposits	3-80	Potential aquifer expected in the alluvial deposits. Brackish water is probable along the coastal areas.
Carmen	flat to hilly ous	5	10	85	0	0	7-18	24-153	2.59	6.97	0.33-0.41 (0.37)	0.10-2.77 (1.05)	4	<2.8			0	20	80	Miocene and older rocks	3-80	Potential aquifer expected in the alluvial deposits. Brackish water probable along the coastal areas.
Jabonga	mountainous	10	0	5	60	25	9-17	21-28	2.21	2.44	0.41-1.03 (0.82)	0.48 (0.48)	18	<2.8			0	20	80	Alluvium deposits	3-60	Potential aquifer expected in the alluvial deposits. Brackish water may occur along the coastal areas.
Kitcharao	flat to mountain-ous	5	0	0	70	25	7-14	21-26	2.41	0.84	0.08-4.13 (1.45)	0.28-0.84 (0.60)	17		3	1.11	0	20	80	Alluvium deposits	3-80	Potential aquifer expected in the alluvial deposits.
Las Nieves	flat	5	25	70	0	0	18.29	54.87		4.27		0.31 (0.31)	12	<2.8			0	10	90	Alluvium/ Plio-Pleis tocene	4-80	Potential aquifer expected in the alluvial plains and low relief hills. High iron content in water reported in the area.
Magallanes	flat	100	0	0	0	0		30.78					3				0	100	0	Alluvium deposits	3-80	Potential aquifer expected in the alluvial plains. Abstraction of brackish water and presence of methane gas reported in the area.

MUNICIPALITY	EXISTING CONDITIONS																	DATA INTERPRETATION		
	TOPOGRAPHY	GEOLOGIC UNITS (%)					WELL INFORMATION						SPRINGS				GROUND WATER AVAILABILITY (%)			AQUIFER FORMATION	ESTIMATED AQUIFER DEPTH RANGE (mbgl)	OTHERS
							DEPTH (m)		AVE. SWL (mbgl)		MAX./(AVE.) SP. CAP. (l/s/m)		TAPPED		UNTAPPED							
		R	N3	N2	N1	O	SW	DW	SW	DW	SW	DW	NO.	AVE. Q (l/s)	NO.	AVE. Q (l/s)	SW	DW	DR			
Nasipit	flat to hilly	5	20	65	0	10	9-19	20-88	2.53	9.29	0.69-2.10 (1.04)	0.04-3.15 (0.54)	5	<2.8	1	-	0	40	60	Alluvium deposits	3-80	Potential aquifer expected in the alluvial plains. Salt water encroachment and high iron content in water reported in the area.
Tubay	flat to mountainous	60	5	5	0	30	10-18	25-77	6.81	2.77	0.21-1.47 (1.04)	0.99-1.04	19	<2.8	6	-	0	40	60	Alluvium deposits	3-60	Potential aquifer expected in the alluvial plains. Brackish water is probable and the presence of methane gas reported in the area.
R.T. Romualdez	flat to mountainous	25	0	25	0	50	8-18	30-107	2.98	1.89	0.11-1.05 (0.35)	0.08-1.89 (0.38)	5	<2.8	3	0.53	0	40	60	Alluvium/ Plio-Pleistocene rocks	6-20	Potential aquifer expected in the alluvial and low relief hills. Presence of methane gas reported in the area.
Santiago	hilly to mountainous	0	0	0	10	90	6-18	27-42	4.64	11.8	0.07-0.50 (0.25)	0.34-0.34 (0.34)	15	<2.8			0	10	90	Miocene and older rocks	3-60	Most area falls under the category of difficult area. A well can be drilled in the deep well area. Development of spring and surface water sources is recommended.

7.6.2 Springs

Untapped spring source identification data are shown in Table 7.6.3. These data were collected and tabulated by questionnaire sheets-untapped spring information format, Data Report, including the parameters of barangay name, owner, discharge, transmission line length, and elevation difference.

Table 7.6.3 Untapped Spring Source Identification

Municipality	Barangay Name	Number	Untapped Spring			
			Owner	Discharge (m^3/hr)	T.L.L. (km)	Elevation Difference
Kicharao	Sangay	1	Public	6.7	2.0	100
	Jaliobong	1	Private	2.7	2.0	130
	San Isidro	1	Public	2.7	3.2	N.A
Tubay	Binuwargan	1	N.A	N.A	1.3	N.A
	Dona Telespora	1	N.A	N.A	1.0	N.A
	II, Poblacion	1	N.A	N.A	1.0	100
	Tagnanarkay	1	N.A	N.A	1.0	N.A
	Tagpangahoy	1	N.A	N.A	0.5	N.A
	Tinigbasan	1	N.A	N.A	0.8	N.A
Cabadbaran	Sanglan	1	N.A	3.6	1.0	150
R.T.R.	Tagbongabong	1	Private	3.6	2.6	15
	San Antonio	1	Public	1.1	2.0	6
	Balangbanlang	1	Private	0.9	3.0	2.4
Buenavista	Malapong	1	Private	3.6	0.5	3
		1	Public	3.6	1.5	5
	Guinabsan	1	Public	3.6	7.0	15
	Rizal	1	Public	3.6	1.3	10
Naspit	Aclan	1	Public	1.8	3.0	180

Note: N.A. Data not available

T.L.L. Transmission line length

7.7 Water Source Development for Medium-Term Development Plan

7.7.1 Spacing Allocation for Level II and III Wells

The pumping rates required for Level I systems are fairly lower than that for Level II and III systems. The well interference in Level I systems need not to be studied in terms of spacing of wells and production rate, since most formations in shallow and deep well areas generally have enough groundwater development potential. As Level II and III wells are usually expected to produce larger discharge to meet the water demand, the spacing of wells to avoid the well interference has to be considered. Spacing allocation for Level II and III wells was examined considering specific capacity, pumping rate, and assumed drawdown of 1 cm at interference radius for a pumping duration of 16 hours.

(1) Specific Capacity

According to the existing well source information, specific capacity was considered with ranges from 0.5 l/s/m to 6.5 l/s/m. To simplify the calculation, an average value in each range is adopted in the calculation of interference radius.

(2) Pumping Rate

The pumping rate was estimated by assuming a drawdown of 10 m with the average value of specific capacity and 16 operation hours/day of pumps. The formula used to determine proper well spacing is the Jacob modified equation. Drawdown at the interference boundary is assumed to be 1 cm after a pumping duration of 16 hours.

Table 7.7.1 presents the estimated spacing requirements and number of wells to be constructed per sq. Km. The spacing interval between adjacent wells to avoid the well interference is planned to be more than twice distances of the calculated interference radius.

Table 7.7.1 Spacing Arrangements for Planned Wells

Range of Specific Capacity (l/s/m)	Estimated Pumping Rate (m^3/day)	Estimated Interference Radius (m)	Estimated Number of wells/km^2
0.5 - 1.5	500	80	45
1.5 - 3.0	1,000	120	20
3.0 – 4.5	2,000	160	11
4.5 – 6.0	2,500	200	7
> 6.0	>2,500	> 200	> 7