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PROVINCIAL CITIES WATER SUPPLY PROJECT
POST-EVALUATION STUDY

A report submitted to the Asian Development Bank, Manila
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27 July 1984

R 822 - 1846

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PHI/PROVINCIAL CITIES WATER SUPPLY PROJECT

POST-EVALUATION STUDY

OBJECTIVES, METHOD AND DATA

This paper reports the results of a field study of two water districts in as many provincial urban centers. The first is the Zamboanga City Water District (ZCWD) in the southwestern tip of Mindanao; the other is the Camarines Norte Water District (CNWD) in southeastern Luzon with its center located in the capital town of Daet.

Objectives. The general objective of the study is to delineate the socioeconomic benefits of expanding and improving the water supply facilities in the two water districts mentioned above. The more specific objectives and the range of data required are set forth in the Preliminary Terms of Reference (Schedule A). In the analysis of the findings presented below these specific objectives are translated into several important questions.

Methodology. Field work in oth urban centers were carried out simultaneously by two different study teams; it began on 25 June and ended 8 July 1984. The methodology used is described more fully in Appendix A. Here it is sufficient to mention that four sources of data were used; these are the following:

a. Key informant interviews. The bulk of the data used in this report comes from this purposively selected group of respondents who were willing to share their knowledge of facts and their perceptions on various issues. Because of the critical role they played in providing data the key informants, identified by the positions they occupy in the community and their numbers, are summarized in Table 1.

Table 1. Key informants interviewed.

City and occupation	Number	
Zamboanga		
ZCWD officials	4	
Barangay officials	23	
City/Ministry of Health officials	6	
City Planning official	1	
Teachers	7	
Nurses/health workers	9	
Residents	<u>17</u>	67
Daet		
CNWD officials	9	
Ministry of Health officials	2	
Municipal officials	4	
Barangay officials	19	
Teachers	4	
Residents	<u>10</u>	<u>48</u>
Total		115

b. Relevant records. Most of the records abstracted in the field came from the local water district office, city/municipal offices, and health offices.

c. Observation data. Data of this type were not gathered systematically. But the advantage of a field investigation is that it allows the investigators to see for themselves various aspects of what they are studying. Interview data could, for instance, be checked visually, and, when possible, they were.

d. Survey data. As the Appendix on Methodology makes clear, a systematic survey of a probability sample of respondents could have been used as the major technique for data gathering. This was rejected, however, for various reasons. Nonetheless, a small survey with a modified version of an interview schedule used in Bogor, Indonesia¹ was conducted among a quota sample of 100 respondent households in each research site. The respondent distribution was as follows:

	Serviced by Water District	Not serviced by Water District	Total
Poor	25	25	50
Rich	<u>25</u>	<u>25</u>	<u>50</u>
			100

¹Unisearch Limited, Evaluation of the Bogor Water Supply Project. A report prepared for the Australian Development Assistance Agency, September 1977. Pp. 67-89, Appendix 9.

It should be evident that the notion behind the selection was to obtain data from respondent households that differ from one another in two important respects: income status and subscription to the local Water District system.

THE STUDY SITES

The Zamboanga City Water District (ZCWD)

In January 1978, roughly four years after the Zamboanga City Water District (ZCWD) was turned over to the Local Water Utilities Administration (LWUA) by the city government, the ZCWD embarked on a wide-ranging expansion program. With financial assistance from the Asian Development Bank (ADB), the ZCWD constructed a coffer dam on the Tumaga River slightly upstream of the existing intake and a new and larger treatment plant and storage tank, and added about 57 kilometers of distribution system pipelines in the city. The expansion project was essentially completed by June 1982.

The ZCWD presently services an estimated 190,000 residents in 24 barangays within approximately 7 km. radius of the Zamboanga City Proper. With the new capacity of 35,000 cubic meters per day, the ZCWD services 16,141² residential, commercial/industrial, and government establishments in 27

²Total service connections as of December 1983. In June 1984, this number increased to an estimated 16,400.

zones (Table 2). This coverage extends from Barangay Mampang in the east, to Barangay Calarian in the west coast, Barangays San Roque and Sta. Maria in the northwest, Pasonanca in the north, and Barangays Tumaga and Guiwan in the northeast.

Zamboanga City itself has a total of 95 barangays. All the urban barangays are within the service area of the WD. Rural areas at the fringe extend all the way to the mountainous boundaries between Zamboanga City and Zamboanga del Sur in the north and northeast, and between Zamboanga City and Zamboanga del Norte in the northwest. A coastal city, Zamboanga is bounded in the south and southwest by the Basilan Strait and the Sulu Sea and the Sibuguey Bay in the east and northeast, respectively.

As of 1980, Zamboanga City had a total population of 343,722. Being the center of government for the Autonomous Region of Mindanao, the long-time hub of commerce between the mainland of Mindanao and Jolo, Sulu, and Indonesia, as well as the site of the headquarters of the Southern Command of the Armed Forces of the Philippines, the City is inhabited by Filipinos of different ethnic origins. The main groups are readily identifiable on the basis of the predominant languages spoken in the city; Chavacano (the native Zamboanguenos), Muslim (usually Tausug; also includes Samal, Yakan, and Maranaw), Tagalog (migrants and soldiers from Luzon), and

Bisaya (mostly Cebuano-speaking Visayans). In addition, English is spoken by most Christians and Muslims who have had at least a high school education.

Table 2. Service connections, by Water District.

Type of connection	ZCWD ^a		CNWD ^b	
	Number	Per cent	Number	Per cent
Residential	15,080	93	4,171	92
Government	227	1	57	1
Commercial	797	5		
Industrial	35	0.2	308	7
Farm	2	0.01		
Total	16,141	99.21	4,536	100

^aAs of December 31, 1983. Source: Zamboanga City Water District Office.

^bAs of June 17, 1984. In the records commercial and industrial user classifications are combined; no classification for farm connections is found. Source: Camarines Norte Water District Office.

The Camarines Norte Water District (CNWD)

The Camarines Norte Water District (CNWD) was formed on November 8, 1973 and, originally was meant to cover the six municipalities then serviced by the former Camarines Norte Metropolitan Waterworks System. These municipalities are Daet, Talisay, San Vicente, Labo, Vinzons, and Mercedes. Another municipality, Basud, was added later.

All seven municipalities are located in Camarines Norte, the northernmost province of the Bicol Region on the island of Luzon. Camarines Norte is primarily dependent on agriculture. About two-thirds of its population are engaged in crop cultivation. Major crops are coconut, abaca, rice, and banana.

The basic water system in the area was constructed about 36 years ago. The CNWD has three water supply sources: Boro-Boro spring, Lugui spring and the Magana spring.

Of the 25 barangays in Daet, 20 are serviced by the Water District, the remaining five are not serviced. These five barangays, San Isidro, Mambalite, Awitan, Bibirao and Calasgasan, all lie on the outskirts of the town. Except for Calasgasan which has a fairly good road as it leads to San Vicente, the next town, the other four barangays can all characteristically be reached by passing a combination of dirt and feeder roads-- greater portions of which are rough and nearly impassable.

The study was conducted in the municipality of Daet, the provincial capital of Camarines Norte and the hub of commerce, industry, and education of the province. With a total land area of 17,017 hectares, the town has been politically subdivided into 25 barangays, of which 8 barangays are classified as urban and the rest rural.

Daet is bounded on the northeast by the Pacific Ocean, on the east by the municipality of Mercedes, on the south by Basud, on the western portion by the municipalities of San Vicente and Imelda and on the northwest by Talisay. It is about 334 kilometers southeast of Manila. Naga, the nearest city in Bicol, is about 95 kilometers away.

Daet registered a total population of 54,700 in 1980. In 1983 there will be an estimated total population of 57,877 based on the population rate increase of 1.9% per annum, while urban population is increasing at 3.58% annually.³

The main economic activity of Daet is farming; there is some commercial and industrial activity. Of the total crop area of 4,047 hectares, 48 per cent are planted to coconut. The annual production of about 205,000 trees is approximately 186,400 nuts. About 90 per cent of these are processed as copra, comprising about 62.16 tons annually.⁴

FINDINGS I. SOME ANSWERS TO THREE QUESTIONS

This part of the report addresses directly three major questions derived from the Preliminary Terms of Reference. The questions are these: (a) Did the project, as designed,

³Socio-Economic Profile 1983. (A report prepared by the Municipal Development Office, Daet, Camarines Norte), p. 13.

⁴Ibid., p. 16.

expand to densely populated low-income areas where the need and demand are greatest? (b) Did the Water District service replace traditional water sources within the service area? (c) Did expansion of the Water District system "reduce the costs of water to the economy through reduction in medical expenses due to lower incidence of water-borne diseases, less time loss for education and work due to illness, avoidance of drilling private wells, divert time carrying water to more productive work?"

Expansion of Project to Beneficiaries

Did the project expand to densely populated, low-income areas? There are three important types of information used in answering this question. These are (a) selected population data per barangay in the urban centers under study; (b) the income statuses of the different barangays within and immediately surrounding the Water District, and (c) a measure of the extent to which households in each barangay are connected to the Water District system. The pertinent general data are summarized in Table 3a and Table 3b. More specific data are abstracted from these tables and reproduced in Table 4a and 4b.

Table 3a. Population, income status, and connection status of selected barangay in Zamboanga City.

Barangay	Population ^a		Households	Social Status ^b			1983 % HH ^c Connected
	Number	Density		% Rich	% Middle	% Poor	
Baliwasan	15,347	103.3	2,559	7.5	27.5	65.0	70
Calarian	4,517	22.7	825	12.5	27.5	60.0	70
Campo Islam	9,570	697.5	1,757	7.5	35.0	57.5	70
San Jose Gusu	7,041	38.0	1,243	10.0	45.0	45.0	70
San Jose Cawa	4,713	113.2	801	0.0	75.0	25.0	90
Sta. Maria	11,028	34.8	1,961	7.5	75.0	17.5	88
Pasonanca	7,490	7.5	1,250	2.0	20.0	78.0	70
San Roque	5,842	15.6	998	10.0	10.0	80.0	70
Tumaga	8,157	30.0	1,392	10.0	10.0	80.0	70
Guiwan	5,953	29.5	1,051	45.0	30.0	25.0	70
Talon-Talon	8,801	31.9	1,466	8.5	32.5	59.0	60
Tugbungan	8,139	29.8	1,847	12.5	22.5	65.0	58
Tetuan	16,996	54.4	2,926	30.0	30.0	40.0	75
Sta. Catalina	11,481	200.2	697	30.0	40.0	30.0	50
Sta. Barbara	4,229	367.4	1,213	0.0	40.0	60.0	62
Rio Hondo	9,226	128.8	1,491	1.0	29.0	70.0	48
Mariki	4,739	215.4	724	5.0	65.0	30.0	48
Canelar	22,251	109.8	4,076	10.0	20.0	70.0	75
Sto. Niño ^d	7,149	272.8	1,219	10.0	40.0	50.0	70
Poblacion ^d	14,446	106.9	2,517	35.0	40.0	25.0	85
Mampang	4,460	10.7	738	0.0	10.0	90.0	58
Sinunoc	4,636	6.1	732	5.0	40.0	55.0	-
Maasin	2,029	3.9	358	0.0	15.0	85.0	-
Malagutay	2,017	3.9	375	0.0	20.0	80.0	-
Cabatangan	1,990	2.5	325	0.0	15.0	85.0	-
Abung-Abong	685	0.9	115	0.0	60.0	40.0	-
Lunsuran	1,444	2.6	248	0.0	30.0	70.0	-

Table 3a (cont'd)

Barangay	Population ^a		Households	Social Status ^b			1983 & H ^c Connected
	Number	Density		% Rich	% Middle	% Poor	
Putik	3,013	13.9	545	10.0	20.0	70.0	-
Divisoria	1,656	2.7	274	5.0	25.0	70.0	-
Arena Blanco	2,757	50.9	486	15.0	15.0	70.0	-

^a 1980 Census of Population by Province, Municipality and Barangay, Region IX (Manila: National Census and Statistics Office, 1980), pp. 28-30. Population density was derived from the total population per barangay as per 1980 Census data, and divided by the area per barangay. Data on the area in hectares were provided by the City Planning and Development Office.

^b Social status data was obtained from key informants in each of the barangays (see Table 1) following the definition of rich, middle, and poor used in the survey.

^c Percentages of households in each barangay with water connections in 1976 and 1983 were estimated by a key informant at the ZCWD.

^d Poblacion includes Barangays 1, 2, 3, and 4 within the City Proper.

Table 3b. Population, income status and connection status of barangays in Daet, Camarines Norte.

Barangay	Population ^a		Households	Social Status ^b			1983 % HH ^c Connected
	Number	Density		% Rich	% Middle	% Poor	
Alawihao	1,647	1.9	300	6.7	33.3	60.0	50.0
Awitan	839	1.4	180	5.0	15.0	80.0	0.0
Bagasbas	2,249	2.4	510	3.9	80.0	16.1	25.5
Bibirao	568	0.3	120	5.0	7.5	87.5	0.0
Borabod	2,214	2.2	4,014	35.0	0.0	65.0	40.0
Calasgasan	1,461	0.5	450	10.0	50.0	40.0	0.0
Camambugan	3,257	5.3	556	5.0	88.8	6.5	60.0
Cobangbang	1,499	2.4	277	1.8	15.0	83.2	1.8
Dogongan	971	0.7	300	0.0	10.0	90.0	3.3
Gahonon	1,571	3.0	307	7.5	82.5	10.0	30.0
Gubat	2,569	1.6	446	30.0	20.0	50.0	30.0
Lag-on	2,472	2.8	468	20.0	25.0	55.0	25.0
Magang	1,605	1.0	286	10.0	80.0	10.0	42.5
Mambalite	1,083	0.8	211	0.0	45.0	55.0	0.0
Mangcruz	754	0.8	132	0.0	20.0	80.0	2.8
Pamorangon	1,086	2.2	210	0.0	28.0	72.0	35.0
San Isidro	1,132	1.6	215	15.0	50.0	35.0	0.0
Poblacion (8 barangays)	27,812	21.7	5,205	20.0	20.0	60.0	67.5

^a1980 Census of Population by Province, Municipality and Barangay, Region V. (Manila: National Census and Statistics Office, 1980), pp. 2-3. Population density was calculated by dividing total population per barangay as reported in 1980 Census data, by the area in hectares per barangay. Data on the area were provided by the Municipal Development Coordinator.

^bIncome status of households were obtained from key informants based on the respective barangay household survey. This source of data was considered reliable upon information that annual households surveys were being conducted in Daet plus the fact that all key informants for the 25 barangays were barangay officials who had access to official barangay records and other census data.

^cPercentage connection was based on key informants' data and from CNWD.

Table 4a. Zamboanga City barangays ranked according to percentage of household connections.

Barangay	Connections (% of HH)	Social Status			Population Density
		% Rich	% Middle	% Poor	
San Jose Cawa	90	0.0	75.0	25.0	113.2
Sta. Maria	88	7.5	75.0	17.5	34.8
Poblacion	85	35.0	40.0	25.0	106.9
Canelar	75	10.0	20.0	70.0	109.0
Tetuan	75	30.0	30.0	40.0	54.4
Baliwasan	70	7.5	27.5	65.0	103.3
Calarian	70	12.5	27.5	60.0	22.7
Campo Islam	70	7.5	35.0	57.5	697.5
San Jose Gusu	70	10.0	45.0	45.0	38.0
Pasonanca	70	2.0	20.0	78.0	7.5
San Roque	70	10.0	10.0	80.0	15.6
Tumaga	70	10.0	10.0	80.0	30.0
Guiwan	70	45.0	30.0	25.0	29.5
Sto. Niño	70	10.0	40.0	50.0	272.8
Sta. Barbara	62	0.0	40.0	60.0	367.4
Talon-Talon	60	8.5	32.5	59.0	31.9
Tugbungan	58	12.5	22.5	65.0	29.8
Mampang	58	0.0	10.0	90.0	10.7
Sta. Catalina	50	30.0	40.0	30.0	200.2
Rio Hondo	48	1.0	29.0	70.0	128.8
Mariki	48	5.0	65.0	30.0	215.4

Table 4b. Daet barangays ranked according to percentage connection.

Barangay	% Connected	Social Status			Population Density
		% Rich	% Middle	% Poor	
Poblacion	67.5	20.0	20.0	60.0	21.7
Canambugan	60.0	5.0	88.0	6.5	5.3
Alawinao	50.0	6.7	33.3	60.0	1.9
Magang	42.5	10.0	80.0	10.0	1.0
Borabod	40.0	35.0	0.0	65.0	2.2
Pamorangon	35.0	0.0	28.0	72.0	2.2
Gahonon	30.0	7.5	82.5	10.0	3.0
Cubat	30.0	30.0	20.0	50.0	1.6
Bagasbas	25.5	3.9	80.0	16.1	2.4
Lag-on	25.0	20.0	25.0	55.0	2.8
Dogongan	3.3	0.0	10.0	90.0	0.7
Mangeruz	2.8	0.0	20.0	80.0	0.8
Cobangbang	1.8	1.0	15.0	83.2	2.4

Zamboanga City

One way of answering the question posed at the beginning of this section is to consider the present distribution of water connections among the 21 barangays within the service area as the given result of the expansion of the ZCWD. The characteristics of the barangays in terms of percentage of the households subscribing to the system, income status and population are then examined.

A convenient starting point for this examination is the division of the 21 barangays into two groups

(high and low) percentage of households connected to the water system. The first group consists of 14 barangays where 70-90% of households have piped connections. This group includes San Jose Cawa, Sta. Maria, in the Poblacion, Canelar, Tetuan, Baliwasan, Calarian, Campo Islam, San Jose Gusu, Pasonanca, San Roque, Tumaga, Guiwan, and Sto. Niño. The second group is composed of the remaining 7 barangays where 48-62% of the households have piped connections. This group includes Sta. Barbara, Talon-Talon, Tagbangan, Mangang, Sta. Catalina, Rio Hondo, and Mariki.

Of the 14 barangays in the first group (i.e., with 70-90% connections), 5 are clustered around the City Proper and the downtown area. These are San Jose Cawa, the Poblacion, Canelar, Baliwasan, and Sto. Niño. Of these 5, only 2 (the

Poblacion and San Jose Cawa) are predominantly middle/upper class in that key informants estimate 51% or more of the households to be in this income class category. One (Sto. Niño) is 50% poor and 50% middle class. The remaining two (Canelar and Baliwasan) of these 5 barangays are poor. These five areas are also highly densely populated areas in that their density exceeds 100 persons per hectare.

The other 9 barangays in the first group (San Jose Gusu, Campo Islam, Sta. Maria, Tetuan, Calarian, Pasonanca, San Roque, Tumaga, and Guiwan) are located on the fringe of the City Proper. Four (Sta. Maria, Tetuan, San Jose Gusu, and Guiwan) of these 9 barangays are predominantly middle/upper class. The other 5 barangays (Calarian, Campo Islam, Pasonanca, San Roque, and Tumaga) are predominantly poor. With the exception of Campo Islam which has the highest overall population density, all of those 9 barangays have low population density.

All the 7 barangays in the second group (i.e., those with 48-62% household connections) are located to the east and the northeast of the City Proper. Of these 7, only 2 (Sta. Catalina and Mariki) belong to the middle and upper classes. Both of these barangays have high population density. The remaining 5 barangays (Sta. Barbara, Talon-Talon, Tugbungan, Mampang, and Rio Hondo) are poor. Only 2 (Sta. Barbara and Rio Hondo) of these 5 barangays have high population density.

The distribution patterns within the ZCWD service area can be seen more clearly when summarized as follows:

1. First group composed of 14 barangays with 70-90% connections:

<u>Location</u>	<u>Social Status</u>	<u>Population Density</u>
a. City Proper (5 barangays)	2 middle/upper class 1 50% rich, 50% poor <u>2 poor</u> 5 barangays	5 high density
b. Outside City Proper (9 barangays)	4 middle/upper class <u>5 poor</u> 9 barangays	1 high density (poor) <u>8 low density</u> 9 barangays

2. Second group composed of 7 barangays with 40-62% connections:

a. East/northeast of City Proper (7 barangays)	2 middle/upper class <u>5 poor</u> 7 barangays	2 high (middle/rich) 2 high (poor) <u>3 low</u> 7 barangays
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This summary indicates that among the 14 barangays with 70-90% connections, there does not seem to be any significant association between connection status, social status, and population density. The 14 barangays are almost equally divided along the middle/rich (6 1/2 barangays) and poor (7 1/2 barangays) categories. They are almost as equally

divided into the high (6) and low (8) density categories. Moreover, the 6 barangays with high population densities are almost equally divided into 2 middle/upper class barangays, 3 poor, and 1 barangay which is 50% rich and 50% poor.

The distribution pattern among the 7 barangays with 48-62% connections, on the other hand, does suggest some association between social status and connection status. There are more poor barangays (5) than middle/upper class (2) in this group. Moreover, there are slightly more high population density areas (4) than there are low density areas (3). However, given the small number of barangays, the significance of this difference should not be exaggerated. Further, among the 4 densely populated areas, 2 are middle/upper class and 2 are poor, thus discouraging any hint of an association between population density and social status among this second group of barangays.

One key informant from the ZCWD gave estimates of the percentage of household connections in 1976 prior to the expansion program. These estimates provide a possible baseline against which to compare the percentage of household connections. Because of the usual reliability problems associated with this type of retrospective data, the percentages are not reported here. However, since the estimates seem consistent with the layout map of the WD before and after

the expansion projects, they provide a rough baseline against which the present distribution of household communities can be compared and the direction of project expansion plotted.

On the basis of this key informants' report and the ZCWD layout map, the bulk of the expansion of the WD pipeline distribution system took place in Mampang, Calarian, Guiwan, Talon-Talon, Tetuan, San Roque, Tumaga, Sto. Niño, Tugbungan, and Sta. Barbara. It must be noted that among these 10 barangays, 6 belong to the first group of 14 barangays described above, i.e., with 70-90% household connections, while 4 belong to the second group of 7 barangays with 48-62% connections. More specifically, of the 10 barangays in which the WD is said to have expanded the most, one barangay (i.e., Sto. Niño) is located in the City Proper, is poor, and has 70% connections; 5 barangays (Calarian, Guiwan, Tetuan, San Roque, and Tumaga) are located on the fringe of the City Proper and are predominantly poor (except Tetuan and Guiwan); and 4 barangays (Mampang, Talon-Talon, Tugbungan, and Sta. Barbara) are located to the east and northeast of the City Proper and are also predominantly poor. Another significant characteristic of this group of 10 barangays is perhaps the fact that only 2 (i.e., Sto. Niño and Sta. Barbara) are densely populated.

Combining the observations gleaned from the percentage of household connections with the retrospective data provided by the key informant as corroborated by the layout map of the ZCWD distribution system, it seems that the direction of the expansion of the WD has not been towards densely populated low income areas but rather, towards less densely populated areas which nonetheless are low income.

Key informant data suggest two important reasons for this pattern of development. The first is that, even before the expansion program started, there already existed a high percentage of household connections in the more densely populated barangays close to the city center; further increases in connections were thus likely to be limited. Secondly, water system construction work in highly congested areas cannot proceed rapidly. For one, the majority of the still unserved population consists of the poor living in the interior and slum areas of Sto. Niño, Canelar, Baliwasan, Sta. Barbara, and San Jose Cawa. For another, construction works in these greatly congested areas are often hampered by the lack of willingness from well-to-do landowners along the main road to grant adequate rights-of-way for the installation of water and sewerage connections. Perhaps expansion away from the city proper, which is densely populated but which is also the preferred location for the rich and middle income households,

to the rural areas, which are not as densely populated and where the population is predominantly poor, is the only way to go.

Daet, Camarines Norte

According to office records, there were already 17 barangays connected to the old water system before the Comprehensive Improvement Program of the Camarines Norte Water District was implemented in 1976. Significantly, the barangays of Pamorangon, Mangacruz, and Cohangbang, now serviced by the new system, were not part of the old system. Magang was connected to the old system; extension of pipelines was undertaken under the present program.

The Comprehensive Improvement Program included a plan to construct a new pipeline with a measurement of 150 mm. to supplement the old 100 mm. pipeline of the old water system serving the Borabod-Bagasbas area. As the Program progressed, however, funds and other resources allotted for the barangays in this area were reallocated for the municipality of Basud. There seems to be at least two major reasons for this change. First, Basud was not connected to the old water system, and the municipality formally petitioned the CNWD for inclusion in the expansion program. Secondly, compared with the Borabod-Bagasbas area, Basud seemed to show greater promise in terms of the number of expected subscribers. In any event, the

reallocation was made. Instead of getting an added and bigger pipeline, the Borabod-Bagasbas area simply had their old 100 mm. pipeline upgraded to a 150 mm. one.

In Daet itself, the expansion program was characterized by the following steps: (a) the extension of piped water to three barangays, namely, Pamorangon, Mangacruz, and Cobangbang; (b) the upgrading of existing pipelines; and (c) the construction of secondary pipelines. Upgrading meant changing the old pipelines with new ones and/or constructing similar pipelines parallel to the old ones. The construction of secondary lines were done in the Poblacion and, in effect, facilitated water delivery to the areas not located along the highway or the main thoroughfares. This expansion probably conferred no advantage on any one income group in contrast with other groups. It is more likely that the expansion benefitted the rich, middle and poor households in equal proportion to their numbers.

It is thus evident that much of the improvements works benefitted to begin with, the 8 barangays that comprise the Poblacion. According to current estimates, the Poblacion has the highest percentage of households connected to the water system. It is also far and above the most densely populated area in the municipality. Further, while the majority of the households are considered poor, this is evidently the area where most of Daet's rich and middle income households are located.

The three barangays--Cobangbang, Pamorangan, and Mangacruz--to which water service was extended as part of the planned expansion of the CNWD should be looked at next. In terms of both population size and density the three are not very different from other barangays outside the Poblacion. In terms of income status, it is worthwhile noting that while Cobangbang and Pamorangan have a high percentage of low-income households (estimated at 83% and 72%, respectively), the reverse situation is observed for Magang where only 10% of the households are considered poor. It is just as worthwhile noting that Magang has the highest percentage of connected households (42% vs. 2% for Cobangbang and 35% for Pamorangan) among the three barangays.

The pattern with regard to the barangays outside the Poblacion is better seen by looking more closely at the three barangays with the highest percentage connection and contrasting them with the barangays with the lowest percentage connection.

The three barangays registering the highest percentage connections are Camambugan, Alawihao and Magang. Alawihao has a majority of households (60%) classified as low income; the balance, 40%, is made up of ^{a combination of} middle and high income households combined. Camambugan and Magang present a different picture. In these barangays, about 90% and 80% of households are within the middle-income bracket.

In these three barangays the relatively high percentage of connection is due to a large number of subscribers belonging to the high and middle income group. In Camambugan and Magang, virtually all the connections to the WD system are accounted for by the high and middle income households; low-income households are not connected at all. In Alawihao about 90% of the connected households are characteristically high and middle income; the remaining 10% of subscriber are accounted for by low income households.

Cobangbang, Mangcruz and Dogongan are the three barangays with the lowest percentage connections. The households in these barangays are almost uniformly poor. In Mangcruz and Dogongan there are even no rich households (according to the classification used in this study) reported.

Of the three, Cobangbang has the lowest percentage connection (2%--"about five or six households with enough extra money," according to one informant). Dogongan is fortunate in that it lies along the route of a large pipeline going to San Vicente town. Even so, there are only 3% of households connected to the WD, and these are all reportedly middle income. Mangcruz' 3% connection is also totally accounted for by middle class households.

From the data and discussion presented above, it is difficult to answer the question posed at the beginning of

this section in the affirmative for Daet. It is unlikely that the expansion of the water system has benefitted the low income households, at least in the capital town of Daet. This pattern is indicative of the continuing pressure on the CWWD to generate income from subscriptions in an area where most households are poor and where there are few commercial and industrial users to help pick up the slack in revenue.

Replacement by Project of Traditional Water Sources

Did the new piped water system replace traditional water sources within the service area? The answer to this question is derived from both key informant interviewing and survey data in both cities.

Zamboanga: the Key Informant Data

As far as could be determined, at least 16 of the 24 barangays within the service area of the ZCWD were served by the previous water system administered by the city government. These include Baliwasan, Campo Islam, San Jose Gusu, San Jose Cawa, Guiwan, Tugbungan, Tetuan, Sta. Catalina, Sta. Barbara, Rio Hondo, Canelar, Sto. Niño, and the Poblacion (4 barangays). Informants recall having been served by the city waterworks since after the Second world War, or at the latest, since the 1950's. For the majority of the population in these areas, the WD had been the source for most of their water needs.

Although most of the barangays in the old service area of the WD have high percentages of household connections (Table 3a), alternative water sources are still made use of in both serviced and unserviced barangays. A majority of those without connections in the service area buy water at ₱0.20-₱0.25 per 5-gallon plastic containers (called bidon) for all their household and personal sanitation needs. However, many also make use of artesian wells (e.g., in Baliwasan, San Jose Cawa, Pasonanca, Tumaga, Guiwan, Tugbungan, Tetuan, and Mampang) for their laundry and bathing needs, or simply go to the Tumaga River to do their laundry. An informant from Canelar reports that there are also quite a number of extremely poor people who, unable to afford drinking water from connected neighbors, dig open wells along the riverbanks and obtain from there water for drinking and cooking as well.

Those with connections who make use of alternative sources do so for the main purpose of maintaining low rates of piped water consumption without sacrificing their wide-ranging use patterns. In the case of a doctor-councilwoman in Canelar who has converted part of her house into a 10-bed hospital, the household found it necessary to install an artesian well for laundry and garden use. Still, on the average, she pays ₱500 per month for water.

Outside the service area, at least three barangays (Malagutay, Cabatangan, and Arena Blanco) obtain their drinking water from neighbors with service connections (i.e., Calarian, the Poblacion, and Mampang, respectively). In Arena Blanco, where the houses are built on stilts by the sea, people have no choice but to obtain water from the nearest service connection in Mampang. In other areas such as Sinunoc, Maasin, Abung-Abong, Lunsuran, Putik and Divisoria, artesian wells are the main source of drinking water. Sinunoc, Lunsuran, Putik and Divisoria have water associations which make use of electric pumps and overhead water tanks installed by the Rural Waterworks Development Council (RWDC) of the city government. Still, a few people in these four areas who could not afford the modest water rates of their respective associations resort to open wells by the riverbank for their drinking and kitchen needs. The river is also used for washing, laundry, bathing in all these unconnected areas except in Arena Blanco. In this latter barangay, people bathe and wash their laundry in the sea.

Inside and outside the service area, it seems that the main determinant of the water sources and usage patterns is socioeconomic status. As previously mentioned, most of the wealthy people within the service area depend on the WD for most of their household needs, including the washing of

cars, gardening, sprinkling of roads to keep the dust down, and bathing of household pets. The middle-income group use artesian wells for washing cars, gardening, and for maintaining the toilet. The poor use piped water mostly for drinking and kitchen purposes, and resort to alternative sources like artesian wells and the river for laundry and bathing.

Outside the service area, it is mostly the rich residents who buy piped water from WD-connected neighboring barangays. Those who cannot afford the price use private or association-owned artesian wells, or open wells by the river-bank. However, all the rich and poor residents alike make use of the river or artesian wells for washing and laundry purposes.

The methods of fetching water in serviced and unserved areas are basically the same. The difference lies in the socioeconomic status of the residents. In unconnected areas, poor people walk the distance between their houses and the water source, toting their 5-gallon containers on bamboo poles (called pingga) or using carabao-pulled sleds. Often, children are entrusted the task of fetching water, and often too, two children are required to tote 5-gallon containers pingga-style. In contrast, more affluent residents (e.g., in Malagutay, Cabatangan, and Arena Blanco) either take the jeepney in fetching water or rely on vendors for their needs.

In Arena Blanco, for instance, rich residents reportedly fetch water in large drums by jeeploads. A resident of Mampang also regularly delivers water by jeeploads to Arena Blanco residents as an income-generating activity.

Daet: The Key Informant Data

In all of the 20 barangays connected to the new water system, traditional water sources (water pumps, deep wells and shallow wells, rivers, streams) still exist and are being tapped and utilized. In the barangays of Lag-on, Alawihao and Dogongan where a mainline to San Vicente passes through, the alternative sources of water are artesian wells, open shallow wells and pumps. Fetching drinking water from houses with water connections is a common practice in Alawihao and Lag-on. In Dogongan where only 10 households have water connections, residents rely on pumps and artesian wells for their water supply. They claim that even water from the wells are safe and clean. In areas located far from households with water connections even unsafe shallow wells become the source of drinking water.

Drinking water is seen by almost all the key informants to constitute a category separate from water used for laundry, cleaning as well as for other sanitary and personal hygiene purposes. Drinking water is expected to be clear, clean and "tasteless." Water for other uses need not have these qualities. This ideal relative to drinking water clashes with

another ideal, namely, that water should be available free of charge. (This notion will be alluded to again in a later section.) But in areas serviced by the CNWD residents will go to the extent of paying for their drinking water, either by subscribing to the system or buying water from subscribers. In the latter case the buyer pays a flat rate of ₱8-₱10 per month to the connected household.

In areas that are not serviced by the CNWD water is bought from Poblacion subscribers at the rate of ₱0.25 to ₱0.50 per gallon and carried home in various containers by passenger jeepneys. Most low income households in Mambalite and San Isidro draw drinking water from artesian wells.

There seems to be little awareness of rainwater as a possible water source; none of the 48 key informants made mention of this source on a voluntary basis. When the suggestion was made by interviewers, informants cited the lack of storage facilities and the common belief that rainwater, when drunk, brings about various respiratory diseases.

It is clear that, even in areas serviced by CNWD, residents continue to rely on alternative sources of water, even as piped water is acknowledged to have the best qualities. It is very likely that the single most important determinant of CNWD water consumption is the income status of the household. Rich households would use CNWD water for all their needs.

Households located lower in the income scale will tend to be more selective in the use of CNWD water. However, appreciation for the quality of CNWD water and the prestige that comes from being known as a user of it exert pressure for greater consumption of CNWD water even among lower-income households.

Zamboanga and Daet: Findings from the Survey

The water demand in both Zamboanga City and Daet is fulfilled in various ways. Among households which are within the Water District, piped water mainly fulfill this demand. In Zamboanga City, the Water District is the sole water source for 92% of the poor households and 84% of the rich households which are connected to it (Table 5). This means that only 8% of the poor households and 16% of the rich households use other water sources apart from the Water District. Although there are more households in Daet which use other water sources in addition to the Water District, the proportion of households which solely depend on the latter is still high at 72% for both poor and rich households.

In areas where piped water is not available, the water sources are numerous and diverse. In Zamboanga City, 56% of the unconnected rich households solely use electric pump and the same percentage of poor households solely depend on

hand pump (Table 6). In Daet, 36% of the unconnected rich households buy water from vendors and neighbor at the same time that they utilize traditional sources (hand pump, open well, and rain). On the other hand, 28% of the poor unconnected households depend solely on open wells. But in both Zamboanga and Daet, many unconnected households obtain water from multiple sources.

Among households connected to the Water District, piped water is generally used for all household activities, but as the activity becomes less personal and intimate, more households are using water from other sources (Table 7). For drinking and kitchen use, all connected households in Zamboanga City and Daet use piped water. For personal sanitation, all connected households in Zamboanga City use piped water but only 88% among the poor households and 92% among rich households in Daet do so. For laundry, all the households in Zamboanga City still use piped water while the proportion of poor and rich households which do so in Daet decreased further at 34% and 88%, respectively. For gardening, a decreased use of piped water can be noted in Zamboanga City but more considerably so in Daet. While those with gardens in Zamboanga City still generally use piped water, other water sources are used by a few. In Daet, the use of other water sources for gardening is more pronounced, only 68% of both poor and rich households do so.

Table 5. Sources of water among households connected to the Water District (in per cent).

Sources	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Water District (WD)	92	84	72	72
WD and traditional sources	8	16	24	24
WD and neighbor	-	-	4	4
Total	100	100	100	100

Table 6. Sources of water among households not connected to the Water District (in per cent).

Sources	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Electric pump	-	56	-	-
Hand pump	56	20	8	16
Neighbor	-	4	4	-
Open well	-	-	28	8
Combination of traditional sources	28	20	24	28
Neighbor and traditional sources	16	-	8	8
Neighbor and vendor	-	-	8	4
Vendor and traditional sources	-	-	20	36
Total	100	100	100	100

Table 7. Sources of water for different household uses among households connected to the Water District (in per cent).

Sources	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
A. <u>For Drinking and Kitchen Use</u>				
Water District (WD)	100	100	100	100
Total	100	100	100	100
B. <u>For Personal Sanitation Use</u>				
Water District (WD)	100	100	88	92
WD and traditional sources	-	-	12	8
Total	100	100	100	100
C. <u>For Laundry Use</u>				
Water District (WD)	100	100	84	88
Neighbor	-	-	4	-
River	-	-	4	-
Open well	-	-	4	-
Combination of traditional sources	-	-	4	12
Total	100	100	100	100
D. <u>For Garden Use</u>				
Water District (WD)	48	84	68	68
Hand pump	-	-	4	4
Neighbor	-	-	4	4
Irrigation canal	-	-	-	4
Open well	-	-	4	-
River	-	4	4	-

Table 7 (cont'd)

Sources	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
D. Waste water	4	-	-	4
WD and traditional sources	-	-	4	12
Combination of traditional sources	-	4	-	-
No garden	48	9	12	4
Total	100	100	100	100
E. <u>For Income-Generating Activities</u>				
Water District (WD)	8	20	12	4
No activity	92	80	88	96
Total	100	100	100	100

While most households surveyed have no income-generating activities apart from their livelihood, those who have depend solely on piped water. Among the poor households, income generating activities are limited to farming and livestock raising. Among the rich, they include restaurant and lodging house operation, orchid growing, dried fish processing and store operation. Nonetheless, despite the use of other water sources for less intimate and personal activities by a portion of the surveyed household particularly in Daet, most still depend on piped-water for all their

activities. No significant difference on this patterns of water use can be noted between the rich and the poor.

Table 8 summarizes the figures on the sources of water used for different purposes by different types of households not connected to the WD system. In Zamboanga City, water for drinking and kitchen use is derived by 80% of the poor from hand pumps, the remaining 20% from other households. Most of the rich draw theirs from electric pumps (72%), the remainder from hand pumps (24%). Basically the same pattern is noted in the cases of water used for personal sanitation, laundry, and gardening. In Daet, the plurality of households both rich and poor, rely on the hand pump as the source of drinking water (36% and 32%, respectively). But more sources are tapped as well: open well (28%), neighbor's facility (12%), and vendor and traditional sources (12%). This source-pattern is altered somewhat for most other water needs as the poor shift their reliance to the open well; the rich do not so much make the shift as add greater use of the open well as a water source for these other purposes.

Table 8. Sources of water for different household uses among households not connected to the Water District (in per cent).

Sources	<u>Zamboanga</u>		<u>Daet</u>	
	Poor	Rich	Poor	Rich
A. <u>For Drinking and Kitchen Use</u>				
Electric pump	-	72	-	-
Hand pump	80	24	32	36
Neighbor	-	4	12	4
Vendor	-	-	8	24
Open well	-	-	28	12
Vendor and neighbor	-	-	8	4
Vendor and traditional sources	4	-	12	12
Neighbor and traditional sources	16	-	-	-
Combination of traditional sources	-	-	-	8
Total	100	100	100	100
B. <u>For Personal Sanitation Use</u>				
Electric pump	-	72	-	-
Hand pump	76	24	16	48
Neighbor	-	4	16	8
River	8	-	-	-
Rainwater	-	-	-	4
Open well	-	-	68	32
Vendor and traditional sources	-	-	-	4

Table 8 (cont'd).

Sources	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
B. Neighbor and traditional sources	12	-	-	-
Combination of traditional sources	4	-	-	4
Total	100	100	100	100
C. <u>For Laundry Use</u>				
Electric pump	-	72	-	-
Hand pump	60	24	12	44
Neighbor	-	4	12	8
River	12	-	-	-
Open well	-	-	68	28
Irrigation canal	-	-	-	4
Neighbor and traditional sources	12	-	-	4
Combination of traditional sources	16	-	8	12
Total	100	100	100	100
D. <u>For Garden Use</u>				
Electric pump	-	60	-	-
Hand pump	44	20	8	36
Neighbor	-	4	12	4
River	4	-	-	4
Rainwater	-	4	-	-
Irrigation canal	-	-	-	8

Table 8 (cont'd).

Sources	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
D. Open well	-	-	56	20
Neighbor and traditional sources	8	4	-	4
Combination of traditional sources	8	-	16	24
No garden	36	8	8	-
Total	100	100	100	100
E. <u>For Income-Generating Activities</u>				
Electric pump	-	24	-	-
Hand pump	16	12	-	12
River	8	-	-	-
Combination of traditional sources	4	-	-	-
No activity	72	64	100	88
Total	100	100	100	100

For income-generating activities the pattern of use of water sources in Zamboanga follows that noted in the previous paragraph. In Daet, one of the poor households surveyed report income-generating activities associated with the use of water; the few rich households that make this report still rely on the hand pump (see Table 8E).

Except for the electric pump, other traditional sources of water necessitates storing to assure a water supply as the household members need it. Thus, among unconnected households in Zamboanga City 88% among the poor and 24% among the rich store water (Table 9); the relatively low percentage of rich households who store water is due to the convenience of piped water generated by the electric pump. But in Daet where electric pump is not used, the percentage of unconnected households which store water is almost the same between the poor and the rich at 76% and 80%, respectively. The reason commonly given by unconnected households in both sites for storing water is convenience (Table 10). But storing water is rendered useless by an efficient water system. Among the connected households in Zamboanga City, only 20% of the poor and none of the rich store water (Table 11). In Daet, 52% of the poor and 28% of the rich store water largely for convenience (Table 12) owing to irregular water supply.

Table 9. Manner of storing water among unconnected households (in per cent).

Manner	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Earthen jar	60	-	52	60
Plastic container	4	-	16	12
Drums	-	12	-	-
Tank	-	12	-	-
Earthen jar and plastic container	-	-	4	6
Earthen jar and pail	-	-	4	-
Plastic container and bottles	-	-	-	-
Pails and bottles	24	-	-	-
Sub-total	88	24	76	80
Not storing water	12	76	24	20
Total	100	100	100	100

Table 10. Reasons given for storing water among unconnected households (in per cent).

Reason	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Convenience	88	24	72	68
To remove unpleasant taste/ smell	-	-	4	4
To improve clarity	-	-	-	4
To cool the water	-	-	-	4
Not storing water	12	76	24	20
Total	100	100	100	100

Table 11. Manner of storing water among connected households (in per cent).

Manner	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Tank	-	-	-	8
Pail	-	-	4	8
Drum	-	-	-	8
Earthen jar	4	-	36	4
Earthen jar and plastic container	-	-	4	-
Plastic container and bottles	-	-	8	-
Pail and bottles	16	-	-	-
Sub-total	20	0	52	28
Not storing water	80	100	48	72
Total	100	100	100	100

Table 12. Reason given for storing water among connected households (in per cent).

Reason	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Irregularity of supply	4	-	20	16
Convenience	16	-	20	8
To cool the water	-	-	12	-
To save rainwater	-	-	-	4
Not storing water	80	100	48	72
Total	100	100	100	100

None of the connected households in Zamboanga City found it necessary to boil their drinking water (Table 13). On the other hand, among the unconnected households 48% of the poor and 8% of the rich expressed the need to boil their drinking water (Table 14). The case in Daet is slightly different. Of the connected households, 24% of the poor and 28% of the rich express the need to boil their drinking water. While this represents only about a quarter of their respective groups, about the same percentages among the unconnected households express the same need. Nevertheless, for both connected and unconnected households in Daet, most report that they do not need to boil their drinking water.

Table 13. Number of connected households which need to boil their drinking water (in per cent).

	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Need to boil	-	-	24	28
No need to boil	100	100	76	72
Total	100	100	100	100

Table 14. Number of unconnected households which need to boil their drinking water (in per cent).

	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Need to boil	48	8	28	28
No need to boil	52	92	72	72
Total	100	100	100	100

Reduction of the Costs of Water
to the Economy

Did expansion of the Water District system "reduce the costs of water to the economy through reduction in medical expenses due to lower incidence of water-borne diseases, less time lost for education and work due to illness, avoidance of drilling private wells, divert time carrying water to more productive work"?

Zamboanga City

The benefits of the WD facility. Informants from the barangays within the WD report that the most important benefits they now enjoy from the water system are the convenience of not having to fetch water, having adequate supply of water 24 hours a day, and having safe, potable water. A few also cite better service from the Water District (e.g., complaints are attended to much faster, leaks which are reported are fixed more quickly).

In contrast, people in still-unconnected areas still go through the inconvenience of fetching water for household use and rather philosophically. In Lunsuran, informants report that schoolchildren and working adults wake up as early as 4:00 in the morning to line up at the RWDC faucets which people pay for at a flat fee of ₱8.00 per month.⁵ They have

⁵Entitlement of 7 kerosene cans of water a day.

to come out early to fetch water for drinking and bathing in order not to miss, or be late at, school or work. In the afternoon, some of them go back to the faucets for their evening needs.

Because people have gotten used to this daily pattern, informants report that they are able to fit this task into their daily schedule without taking time away from the important tasks of schooling or earning a living. In some households, these chores are taken over by unemployed household members or the housewives.

Waterborne diseases. In contrast, even in areas serviced by the WD, informants are quick to point out losses which people may incur as a consequence of contracting diseases, waterborne or otherwise. Even common illnesses such as colds, fever, or influenza in the family interfere with the schooling of children and the adults' gainful employment, and are often heavy on the budget as well.

Data obtained from key informants and records of the City Health Office indicate that waterborne diseases are not altogether infrequent inside and outside the WD. Within the service area alone, informants from 13 barangays report incidence of diarrhea and gastroenteritis, typhoid and cholera, amoebic dysentery, and skin diseases contracted from, among other things, WD pipes, rivers, and artesian and open wells.

Outside of the service area, six out of nine barangay informants report similar cases (see Table 15).

Reports of diseases contracted from the ZCWD pipelines do not necessarily reflect negligence on the part of the WD. For as informants from the WD and the City Health Office report, water from the treatment plant and at several points of the distribution system are tested regularly and reports are just as regularly submitted to the City Health Office. Moreover, part of the job of City Health employees is to monitor and to approve applications for connections at certain points of the distribution system. In Talon-Talon, for instance, where the city dump is located and where water is therefore prone to contamination, some applications for connections have been known to be disapproved.

However, an informant of the ZCWD admits that while the bacteriological count in water from the storage tank may be low, some connections may in fact transmit bacteria which are able to enter the system through leaks. In this regard, the cleanliness of the surroundings in which the piped connections are left exposed becomes the more crucial factor as will be discussed in the section that follows.

It is unfortunate that there is no available time-series data on the number of cases of waterborne illnesses in the 30 barangays under study. It is therefore impossible to ascertain the extent to which the installation and improvement in the service delivery of the WD have influenced the

Table 15. Reported waterborne diseases inside and outside the Water District.

Barangay	Waterborne disease	Reported source	Usual victim
<u>Connected areas:</u>			
Tumaga	amoebic dysentery & diarrhea	ZCWD pipelines Tumaga River	bunkhouse residents near the river
San Roque	cholera, typhoid & diarrhea	artesian wells	Upper San Roque residents
Talon-Talon	gastroenteritis, dermatosis & diarrhea	contaminated ZCWD	children
Baliwasan	gastroenteritis	contaminated feeding bottles	infants
Campo Islam	skin infections	no data	no data
San. Jose Cawa	amoebic dysentery	no data	no data
Guiwan	not specified	polluted river	children
Sta. Catalina	diarrhea	improper handling of water	children
Sta. Barbara	skin diseases	personal hygiene	children/adults
Mariki	gastroenteritis	fruits	children/adults
Canelar	amoebic dysentery	ZCWD pipelines improper handling of water	children
Poblacion	gastroenteritis hepatitis, diarrhea	dirty water containers	children/adults
Sta. Maria	gastroenteritis	unwashed fruits	children

Table 15 (cont'd).

Barangay	Waterborne disease	Reported source	Usual victim
<u>Unconnected areas:</u>			
Divisoria	gastroenteritis	no data	children 3-4 years old
Sinunoc	stomach ache	river	no data
Malagutay	amoebic dysentery	river	children
Cabatangan	cholera, amoebic dysentery	open wells and river	children
Abong-Abong	amoebic dysentery	untreated pipelines from Tumaga River	children/adults
Putik	amoebic dysentery and skin diseases	artesian and open wells, river	adults/children

health situation in these barangays. However, records of the City Health Office on the incidence of these diseases in Zamboanga City from 1974 to 1983 do show some interesting trends (Table 16).

Of the four waterborne diseases included in City Health records, only gastroenteritis shows a definite decrease over the 10-year period. In contrast, typhoid fever and amoebic dysentery have increased. The incidence of infectious hepatitis seems to have fluctuated over the years although there seems to be a general decrease from 1976 to the present.

Even with the City Health records, however, it is still difficult to ascertain the extent to which the statistics, in fact, reflect the real incidence of these illnesses in the city. With the introduction of the Primary Health Care Program (PHCP)⁶ sometime in the 1976, it is possible that the reported incidence of some illnesses may have gone up because more people may have gained access to urban and rural health centers and practitioners. It is possible that the trends shown by City Health records simply reflect an increase in the reach of the PHCP rather than in the actual incidence of these illnesses.

⁶The Primary Health Care Program is a nationwide program which seeks to provide services to communities on the following eight points via health centers or the Barangay Health Unit: (1) health education, (2) an expanded program of immunization, (3) family nutrition education, (4) family planning, (5) maternal and child health care, (6) safe water and environmental sanitation, (7) treatment of endemic diseases, and (8) herbal medicine.

Table 16. Cases of waterborne diseases in Zamboanga City.^a

Year	Gastro- enteritis	Amoebic Dysentery	Infectious hepatitis	Typhoid Fever
1974	2,158	4	41	5
1975	2,073	3	33	6
1976	2,320	5	52	13
1977	1,620	5	135	27
1978	1,132	19	109	43
1979	1,120	19	78	22
1980	1,316	82	105	37
1981	1,300	157	233	73
1982	651	112	112	86
1983	380	190	49	n.d.

^aSource: Statistics Division of the City Health Office, Zamboanga City, June 1984.

Perhaps in the WD service area, the incidence of waterborne diseases could be justifiably due more to conditions of sanitation and personal hygiene than to the quality of water from the pipelines per se. As some informants in the medical profession have pointed out, water becomes a carrier of diseases when it is improperly stored and handled. In the case of people within the service area who buy water from neighbors, water stored in dirty and uncovered plastic containers have been suspected of causing children to contract diarrhea.

As mentioned earlier, the state of cleanliness of the pipelines' surroundings affect the potability of piped water especially where leakages occur. Perhaps this would not be much of a problem if the sanitation conditions in the City were different. For while the city government does provide for garbage collection, and while most people in the city and even the outskirts have flush and water-sealed toilets, the garbage collection, toilets, and sewage facilities clearly have not reached the point of adequacy.

Garbage collection is done by the city government along the main roads of the barangays within the city proper. The system is inadequate in two ways.

First, only the affluent households and business establishments are able to afford the yearly contributions people make to the garbage collectors so that their trash would be

collected.⁷ The others simply throw their garbage onto depressions on the ground. Those who have enough space in their yards incinerate their garbage; those who do not simply dump their garbage onto the river, the swamp, or someone else's yard.

Secondly, the bulk of the population in the City Proper reside in the interior sections of barangays, not along the main roads. Because of their inaccessibility, the residents in these interior areas can not avail of the garbage collection system along the main roads.

There is also great discrepancy in the toilet system of those who are rich or middle class and those who are poor. Most well-to-do households have flush toilets, or, at the very least, ordinary water-sealed toilets. These are maintained using water mainly from the WD. Less well-to-do households have antipolo-type toilets (closed pit system); only a few reportedly have open-pit toilets. In some areas which have been reached by the Primary Health Care Program, "sanitary pits" which are closely akin to antipolo-type toilets have been constructed with government assistance.⁸ In spite of this campaign, however, reports from different barangays inside and outside the WD are that the number of residents without toilets is still considerable.

⁷One informant "contributes" as much as P300 a year.

⁸The government provides the construction materials while the beneficiary provides the labor.

In sum, the brief field investigation in Zamboanga showed the following important patterns. First, residents appreciate the convenience of having safe, potable water for household use at hand. On the other hand, the time spent in fetching and storing water by those who do not have access to this facility is not necessarily seen as a loss since this chore is seen as an integral part of the fixed household chores, and most households have unallocated man-hours that can be utilized for this purpose. Second, the ZCWD and the City Health Office have taken the reasonable steps necessary to provide safe water for household needs to city residents. This provision is likely to have contributed significantly to the diminution of the incidence of water-borne diseases with commensurate savings to the economy. However, it is difficult to isolate this particular effect with any precision from the data at hand for at least two reasons: (1) control of waterborne diseases is not just a function of the water supply system; it is a function of the larger sanitation situation as well; and (2) the necessary statistical records are either simply not available, or could not be collected and processed within the time limits of the present study.

Daet, Camarines Norte

The benefits of the WD facility. Informants from the barangays within the WD emphasize the convenience afforded by

the present water system. Households with connections do not have to fetch water for their daily needs. Although there are alternative sources of water around them, the presence of a faucet and a steady supply of potable water fulfill a basic need most effectively. It is acknowledged by informants that for those with connections, a great amount of time and energy is saved with the availability of water in the area. They are quick to point out, however, that fetching water and storing it are activities perceived not to take time as these have always been traditional components of household chores.

Waterborne-diseases show a significant decrease in the incidence of waterborne diseases in Daet. In 1975, when the new water system started to operate, the total cases of waterborne diseases was recorded at 3,881. 1983, however, shows a marked reduction in this figure, with the Rural Health Office reporting only 385 cases (see Table 17).

Despite the pattern observed, one must be careful about fully ascribing to the new water system the reduction in the number of waterborne diseases in the area. One may safely assume, without negating the contributions of the improved water delivery in the area, that health delivery improved considerably with the Primary Health Care Program of the government.

Table 17. Morbidity and mortality rates for waterborne diseases in the municipality of Daet in Camarines Norte from 1970 to 1983.

Year	Population	No. of Cases	Rate	No. of Deaths	Rate
1970	50,620	2023 (2)	3996.4	111 (5)	219.3
1971	51,492	2760 (2)	5360.0	133 (3)	258.3
1972	52,378	3642 (2)	6953.3	176 (3)	336.0
1973	53,280	3594 (2)	6745.5	240 (2)	450.5
1974	54,198	2261 (2)	4171.7	114 (4)	210.3
1975	55,132	2395 (1)	4344.1	139 (3)	252.1
1976	56,081	2177 (1)	3881.9	298 (2)	531.4
1977	57,047	3354 (1)	5879.4	190 (3)	333.1
1978	58,029	1987 (1)	3424.2	230 (3)	396.4
1979	59,028	1806 (1)	3059.6	276 (1)	467.6
1980	60,045	427 (3)	711.1	54 (4)	89.9
1981	61,362	510 (2)	831.1	67 (4)	109.2
1982	63,264	353 (4)	558.0	81 (4)	128.0
1983	65,774	385 (3)	585.3	53 (4)	80.6

- Remarks:
1. The 1970 population is actual NCSO count; the figures for 1971-79 are extrapolated; the 1980-83 population data are estimates of the RHU.
 2. The rates are for every 100,000 population.
 3. For the years from 1970-79, waterborne diseases include gastroenteritis and dysentery. The records show the emergence of infectious hepatitis from 1980 on. Since a private practicing dentist attributed the diseases to water, it was included in the count.
 4. The numbers inside the parentheses denote the rank of waterborne diseases as cause of illness and death.

Sanitation and personal hygiene practices may also be considered relatively good, especially in the Poblacion. High and middle income households in the eight barangays in the poblacion generally have flush toilets. Some low income households have water-sealed types; the rest still dispose of waste through the "wrap-and-throw" method. The Daet River and canals are convenient dumping areas.

High income households in the rural barangays connected to WD have flush and water-sealed toilets. Middle income households would have water-sealed toilets of the antipolo type. The use of antipolo-type toilets as well as shallow pits covered with palm fronds after use are common among low-income households.

Garbage collection in the Poblacion is a major problem in that there is only one truck collecting all the garbage in the area. Fortunately, although the Poblacion is the most densely populated area, density is not as high as in, for instance, many areas of Zamboanga. Hence the garbage problem may not be that serious in relative terms.

What then are the findings in Daet that are relevant to the question posed at the beginning of this section? Mainly that in areas serviced by the CNWD or reached by it in other ways the availability of potable water is seen to fill a very basic need; the water is thus used and presumably

contribute to the reduction of costs of water to the economy through the string of benefits suggested in the question. Beyond this general observation it is difficult to demonstrate from the data how specifically the benefits occur. Records show a significant decline in waterborne diseases since the operation of the expanded CNWD system, but the impact of the improved water system on this decline still needs to be sorted out from such factors as the Primary Health Care campaign, use of sanitary toilets, and disposal of garbage.

FINDINGS II: THREE SYSTEMIC ISSUES

Perceptions of the Performance of the Water District System

In the introduction to the last section the residents of both urban centers were reported to be very positive towards the existence of a potable water system. Here, the matter of residents' perception of the performance of the Water District System is pursued further, if briefly. As in previous sections, the data from key informants are reported separately for each site. Then the survey data are combined and findings presented.

Zamboanga City: Key Informant Data

Quality and efficiency of construction. The improvements made by the Water District in the pipeline distribution system included mainly increasing the lengths of pipelines, especially lateral lines, installation of newer and better fittings and meters, and using bigger pipes. The efficiency and quality of the implementation of these improvements were generally regarded by informants as, on the whole, satisfactory if not highly so. There are various specific complaints but these may be considered minor.

WD officials reported that the task of restoring the pavements in affected areas was the responsibility of the city government and cost around ₱373,000. They also

reported that in some barangays, pranksters used to switch signs in construction areas thereby increasing the possibility of accidents. In another barangay, road signs were found stored in some private "bodega." To prevent further thefts, WD resorted to using culverts to reroute traffic.

Remarks regarding the quality of construction included some doubts regarding the use of plastic and asbestos pipes instead of iron when these materials are said to have harmful effects.

Adequacy of water. Among the informants from the 22 barangays, most found the provision of water from the WD as "either very satisfactory" or "satisfactory." A negative rating was made by a respondent from Calarian which, WD officials admit, get water only 2-3 hours a day because of its higher elevation and the subsequent low water pressure in the area. The adequacy of water was attributed by a Sta. Catalina respondent to the fact that the WD has a large 10,380 has. watershed. The guards in the watershed have been increased to protect it better.

Efficiency of delivery. Most informants also thought the efficiency of water delivery to be "very satisfactory" or "satisfactory." The barangays whose informants were dissatisfied came from Calarian and others where water is only intermittently available. Other barangays report

interruptions in water delivery but do not find these troublesome because the WD gives advanced notice on the interruptions. Also, while leakages in Sto. Niño, Baliwasan and Cawa-Cawa were reported to have occurred, these were attended to by the WD immediately.

Water rates. In general, among the connected barangays, the biggest problem people encounter with the WD is the high water rates, which they consider to be high.

In the 22 barangays, only a minority were satisfied with the water rates, most expressed dissatisfaction. Some informants cannot understand why water should be more expensive than electricity when water is "free" in nature. The majority report that the new water rates were extremely hard on the household budget especially with the present high price of commodities.

It appears, from the foregoing discussion, that most people were satisfied with the way the water system was constructed, the adequacy of the water provided, and the efficiency of water delivery. However, most of them were highly dissatisfied with the water rates.

Daet Camarines Norte: Key
Informant Data

Quality and efficiency of construction. Despite the awareness of the controversial use of asbestos pipes in the CNWD pipeline distribution system, most of the key

informants from both the serviced and non-serviced areas gave the WD a very satisfactory rating regarding the quality and efficiency of project construction. A key informant from Dogongan was greatly impressed by the large pipelines installed. One of the few key informants who expressed dissatisfaction about the construction (i.e., from the Poblacion) cited the failure of WD technicians and workers to cover the diggings they made on the streets.

Adequacy of water. In the serviced barangays, the adequacy of water provided by the water district was rated "very satisfactory" and "satisfactory." One informant (from Bagasbas) complains that during summer months, water is available only in the evening in spite of the improved technology supposedly utilized by the CNWD.

In the non-serviced barangays, informants agree that the CNWD does supply a highly adequate amount of water to its consumers in the serviced areas.

Efficiency of delivery. Informants from the 20 serviced barangays expressed general satisfaction about the efficiency of water delivery of the CNWD.

Water rates. Whenever the subject of water rates is brought up, one generally comes face to face with a complaining public. The most negative reactions against the WD is dramatized in the people's perception of the water rates under the new water system.

Of the informants in the 20 barangays, only two found the water rates satisfactory, one reported it to be very unsatisfactory, and 17 found it unsatisfactory. The informants who reported satisfaction came from the Poblacion. One of these two explained that even if the water rates are high, at least one is assured of clean and safe water which helps minimize diseases in the area. The other informant said that high water rates cannot be avoided since the cost of living also keeps increasing; also, the CNWD has to pay the loan used in the expansion project.

When looking into water rates and the perception of the informants, several issues come up. The first is the matter of the loan that must be paid by the CNWD. Most of the informants who expressed dissatisfaction regarding the increase in water rates ascribe these increases to the fact that the interest on the loan has also been increased. Another matter people wonder about is why they should pay for something, i.e., water, which comes from nature. And still another matter pertains to the minimum rate of ₱30.00 for a minimum of 10 cu.m. of water which the ordinary consumer has to pay even if his consumption does not reach 10 cu.m. Consumers feel that the reason why people in the non-service areas are not keen on having water connections is mainly because of the water rates.

Zamboanga and Daet: Findings from the Survey

The key informants' perception of the performance of the Water District System is supported by the survey informants. The balance of opinion (the difference between positive assessments and negative assessments) of the quality of construction, and the adequacy of water provided is heavily in favor of the WD in Zamboanga and Daet. This response pattern is carried to the ratings given to the WDS for efficiency of water delivery, even though a small percentage in Daet express dissatisfaction. With regard to the rating given to the Water District for the cost of water, the balance of opinion in both cities is on the unsatisfactory side, with more Zamboanga respondents expressing a negative judgment than Daet respondents. The data are summarized in Tables 18-21.

Table 18. Rating given to water district based on quality of efficiency of construction (in per cent).

Rating	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Very satisfactory	20	40	-	12
Satisfactory	80	60	96	76
Unecided	-	-	-	4
Unsatisfactory	-	-	4	-
Very unsatisfactory	-	-	-	-
Total	100	100	100	100

Table 19. Rating given to the Water District based on adequacy of water provided (in percent)

Rating	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Very satisfactory	32	24	-	12
Satisfactory	68	76	100	84
Undecided	-	-	-	4
Unsatisfactory	-	-	-	-
Very unsatisfactory	-	-	-	-
Total	100	100	100	100

Table 20. Rating given to the Water District based on efficiency of water delivery (in percent)

Rating	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Very satisfactory	60	44	-	28
Satisfactory	36	56	96	60
Undecided	4	-	-	8
Unsatisfactory	-	-	4	4
Very unsatisfactory	-	-	-	-
Total	100	100	100	100

Table 21. Rating given to the Water District based on the cost of water (in percent)

Rating	Zamboanga		Daet	
	Poor	Rich	Poor	Rich
Very satisfactory	-	-	-	8
Satisfactory	20	8	44	48
Undecided	14	28	-	0
Unsatisfactory	28	20	48	28
Very unsatisfactory	40	44	8	8
Total	100	100	100	100

Selected Factors Associated with Consumption

What association, if any, is there among the variables water consumption, the size of the household and the income of the consumers? This question is examined in the present section.

Water rates. As was seen in the preceding section, the main complaint in both Zamboanga City and Daet is on the water rates. In Zamboanga City, informants report that when the Water District was still managed by the city government, the monthly payment was a flat rate of ₱3.00 per month. Those without connections bought water for only ₱0.05 per 5-gallon container. As a result of the higher rates in the present Water District, people have become frugal in using water. (For example, in Sto. Niño and Canalar, informants report that they open the main valve only half-

way to decrease the water pressure and to slow down the revolution of the water meters. They also expressed their appreciation that the Water District disseminates, through the radio, tips on how to use water more efficiently to keep the water bills down.)

The present water rates system in Zamboanga City is shown in Table 22.

Table 22. Current water rates of the ZCWD

Connection size	10 cu.m.	11-30 cu.m.	31-60 cu.m.	over 60 cu.m.
Domestic or government:				
3/8"	₱ 3.00	1.75	1.90	2.10
1/2"	29.00	1.75	1.90	2.10
3/4"	61.85	1.75	1.90	2.10
1"	123.75	1.75	1.90	2.10
1.5"	309.30	1.75	1.90	2.10
2"	773.30	1.75	1.90	2.10
3"	1,392.00	1.75	1.90	2.10
4"	2,783.90	1.75	1.90	2.10
Commercial/Industrial:				
1/2"	₱ 77.35	3.50	3.80	4.20
3/4"	123.70	3.50	3.80	4.20
1"	247.50	3.50	3.80	4.20
1.5"	618.60	3.50	3.80	4.20
2"	1,546.60	3.50	3.80	4.20
3"	2,784.00	3.50	3.80	4.20
4"	5,567.80	3.50	3.80	4.20
Wholesale/bulk:				
Government (no service charge)		4.35	4.70	5.20
Commercial (no service charge)		8.70	9.40	10.40

While complaints on the present water rates were also expressed by the key informants in Daet, their greater concern was over the forthcoming rate increases. Such increases may result in a number of disconnections and the higher usage of water from other sources. Informants who are not connected said that with the increases in water rates, most residents will not seek connection and will continue using their present water sources. Only a few who can afford the convenience of piped water will seek connection.

This situation poses a dilemma to the Water District officials. While there is a need to expand the water service, the water rates may not attract enough concessionaires. Moreover, they need more funds to finance the expansion. The situation is aggravated by the limited commercial and industrial concessionaires in Daet. Thus, while in Naga City there are only 4000 concessionaires as against 8000 in Daet, the income of both water districts is almost equal. The present water rates in Daet is shown in Table 23.

Income status and household size. Survey data show the connected households particularly the poor, to utilize two mechanisms to adapt to the situation of high water costs. One mechanism is to limit activities which need water. In Zamboanga City where the price of water is a principal complaint, 48 percent of the poor do not maintain a garden while only 3 percent do so among the rich (Table 24). The situation in Daet may be different because the price of water is not as great an issue. Nonetheless, it can be inferred that the poor in Zamboanga city must be keeping their water uses to the basic personal and household needs compared to the rich. As a result, the poor households have a low average water consumption of

Table 25. Current water rates of the QNWD

A. Metered Services

1. Domestic/Government

- a. Service charge according to sizes (minimum charge includes first 10 cu.m.)

1/2" \emptyset	₱ 30.00
3/4" \emptyset	48.00
1" \emptyset	96.00

- b. Commodity charge (in excess of the first 10 cu.m.)

11 cu.m. - 25 cu.m.	₱ 1.70/cu.m.
26 cu.m. - 45 cu.m.	1.80
46 cu.m. and up	1.95

2. Commercial/Industrial

- a. Service charge according to sizes (minimum charge includes first 10 cu.m.)

1/2" \emptyset	₱ 60.00
3/4" \emptyset	96.00
1" \emptyset	192.00

- b. Commodity charge (in excess of the first 10 cu.m.)

11 cu.m. - 25 cu.m.	₱ 3.40/cu.m.
26 cu.m. - 45 cu.m.	3.60
46 cu.m. and up	3.90

B. Fire Hydrants

Public hydrants each at ₱ 5.00/month flat rate.

Table 24. Average water consumption of connected households (in percent)

Zamboanga City		Daet	
Poor	Rich	Poor	Rich
56.60	220.90	39.51	44.49

only ₱56.60 per month compared to the rich whose average water consumption is ₱220.90 per month (Table 24). In Daet the variance of water consumption between the poor and the rich is not as wide as in Zamboanga City. The average consumption of the poor households is ₱39.51 while that of the rich is ₱44.49.

In comparison with income, household size may not be as strong a variable affecting the amount of water consumed. Among the connected households in Zamboanga City, the poor households have an average of 7.6 members while rich households have an average of 8.0 members (Table 25). In Daet, the poor households have an average of 6.3 members while the rich households have an average of 5.5 members. Hence, in both study sites, the household size does not vary much between the rich and the poor. Further it is unlikely that the number of children in the household affects water consumption in any significant way. In Zamboanga City the poor household have an average of 2.1 children while the rich have only 1.3 but the rich consume more water (Table 26). In Daet, the poor households have also more children at an average of 2.2 compared to the rich households which have an average of only 1.4 children. But the rich households also consume more water.

Table 25. Average household size of both connected and unconnected households

	Zamboanga City		Dast	
	Poor	Rich	Poor	Rich
Connected	7.6	8.0	6.3	5.5
Unconnected	7.0	3.3	5.6	6.7

Table 26. Average number of children below twelve years of age of both connected and unconnected households

	Zamboanga City		Dast	
	Poor	Rich	Poor	Rich
Connected	2.1	1.3	2.2	1.4
Unconnected	2.1	2.0	1.6	2.0

Another mechanism utilized to adapt to the situation of high water cost is to share connections with other persons who may contribute to the monthly payment. This is done by 40 percent of the poor households in Zamboanga (Table 27). Around 16 percent of them share their connections with 24 others while the rest share it with a lesser number. But no one among the rich share water connection. However, in Dast, 16 percent of the rich households also share their connections; the figure is higher among the poor, which is 44 percent.

Table 27. Number of persons using the water connection aside from the household (in percent)

	Zamboanga City		Daat	
	Poor	Rich	Poor	Rich
None	60	100	56	84
1	-	-	8	4
2	-	-	4	-
3	-	-	3	-
4	8	-	8	4
5	-	-	8	4
6	8	-	4	4
7	-	-	-	-
8	4	-	-	-
13	4	-	-	-
24	16	-	4	-
Total	100	100	100	100

Consultative Mechanisms

The discussion in this section outlines the procedures that were followed by the ZCWD and the CWD in implementing their respective expansion projects, with particular attention to any consultation made with local residents. A summary of what informants think of popular participation in development projects in general and in the expansion project in particular is also provided. Information reported here is based solely on key informant data.

Zamboanga City

ZCWD personnel report that prior to and during the expansion activities general assemblies were conducted in various barangays where ZCWD representatives explained the improvements intended by the project and the nature of the loan from the Asian Development Bank. These assemblies, and the campaign to encourage greater attendance and participation in them, served as forums for communication between the ZCWD and the people. For the ZCWD, in particular, they provided opportunities to test people's reactions to proposed water rate increases.

This view does not tally well with key informant data from the various barangays. In many areas which had existing connections with the WD and where the expansion activity consisted mainly of installing larger pipes and extending laterals, informants report that they did not hear of local people being consulted with regard to the design and manner of implementation of the project. In a few barangays informants do report that WD personnel consulted households regarding their preferences on the location of new pipes being laid; barangay captains were also approached for assistance in securing rights-of-way.

In any event, it now seems widely recognized by informants in both serviced and non-serviced areas, that a barangay resolution requesting for the services of the WD is usually required prior to any action from the agency. The WD does not undertake lateral expansion projects without a petition from the Barangay Council in the areas involved. Accordingly, the WD formed a Barangay Water Advisory Council in 1981. Composed of barangay officials, this serves to determine the priorities within the WD and to

advise the agency on the needs of each barangay. The assumption is that it is the barangay officials who will take the responsibility of consulting their respective constituents regarding water matters.⁹

After receiving a petition, the ZCWD studies the technical and socio-economic potentials of the request, undertaking a feasibility study which takes into account, among other things, the situation of potential concessionaires and the duration of the period in which the WD expects to recover its investments. The ZCWD also consults with barangay officials regarding the right-of-way concerns of the potential project. If everything goes well and funds are available, the ZCWD implements the activity requested.

Thus far, the WD has received 37 requests for different types of services (mostly extension of main and lateral lines). But because of financial constraints, it has been able to respond to only 13 so far. In Arena Blanco, for instance, the ZCWD general manager reports that the requested extension of the water system would require ₱2.2 million, according to an initial estimate. This amount is expected to have increased because of the recent devaluation of the peso. Although the project will require only 1 kilometer or so of additional pipelines from Marung, the project will be expensive because Arena Blanco is an elevated area; a booster pump and an overhead tank will consequently have to be installed.

⁹While the relationship between the WD and the BWAC was good in the beginning, communication between the two entities have reportedly deteriorated. Some BWAC officials were suspected of taking advantage of their relationship with the ZCWD; some borrowed WD transportation facilities for personal uses and/or obtain loans from the agency without paying for them.

This is the same kind of problem which the WD has to contend with if it were to extend nes to Lunsuran and Putik.

Another form of consultative mechanism which the ZCWD adopted in May this year, prior to increasing water rates by 60%, was the form of public hearings. Announcements of the plan were made over the radio, and people reacted by sending barangay officials to the City Hall to dispute the increase. Some members of the private sector petitioned for a court injunction; more public hearings were made and more objections were aired by radio commentators. One reported significant result was a promise by the ZCWD to implement the price increase on a staggered basis. However, at the time of this study, informants reported that the ZCWD had won its case in court and the full 60% increase was immediately effected.

Opinions regarding participation. In the interview situation informants seem to accept the principle that there should be public participation in planning, designing, and implementing water supply projects as a matter of course. However, there is little idea on the specifics of this participation. In fact, the only specifics articulated were for the ZCWD to inform the public of its plans and to hire laborers from the same barangay where construction work is being undertaken. In contrast, two informants thought it was not necessary to get people to participate since the present consultative mechanisms of the Barangay Council seemed sufficient.

There is some suggestion in the data that in barangays where captains do not meet with their constituents often enough there is likely to be a greater desire for a more active form of participation expressed by barangay residents.

Duct

All the Water District officials interviewed said that the new water system was set up after consultations with local officials and residents in the form of public hearings, personal visits and barangay assemblies. During these consultative activities the new water system was described and people's opinions and suggestions noted. In one meeting, construction design was said to have been considerably altered (i.e., the number of reservoirs installed) as a result of people's suggestions and recommendations. The consultation activities were continued through the construction phase up till completion of the system. Further, details of the improved water system were aired over the radio. Local residents confirm that these activities did take place.

Needless to say, the WD officials profess a high value for public consultation. The engineers, on the other hand, express reservations on the matter, explaining that the technical aspects of waterworks systems are difficult for the general public to understand. Members of the board of the Water District also expressed the opinion that consultative activities take time and money and suggest that the results are

not worth the cost. However, they also see the usefulness of keeping the public fully informed on WD matters in order to forestall any suspicion of wrongdoing on the part of WD personnel. Finally, they feel that there was no choice on the matter since public consultation is a requirement of LWUA rules and regulations.

Municipal officials concede the importance of public consultation in principle but express doubts on the usefulness of this principle in the case of water systems which they consider too technical for the ordinary citizen. One municipal councilor referred to their meetings with the WD officials as ceremonial. All the municipal councilors interviewed report that now the WD only holds public consultations when the water rates are to be increased, and seemed to suggest that this is one appropriate occasion when consultations are called for.

All the barangay officials said, in effect, that public consultation is useless because the Water District officials are in a better position to determine the best courses of action where waterworks issues are involved.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The findings have been reported in greater detail in the preceding sections, and interpretations have been offered in various places as these flowed naturally from the presentation. In this section a more systematic summary of the findings and interpretations are presented. Further interpretations are offered by way of conclusion. Then some recommendations are made.

The Findings

1. Did the Project, as designed, expand to densely populated, low income areas where the need and demand are greatest? In Zamboanga City, the answer is a qualified yes. The expansion of services that took place in the urban center benefited the rich and poor alike. Nonetheless, the outward expansion has been towards less densely populated, more rural, but low income areas. In Daet the direction of expansion has been towards areas where more affluent subscribers reside, although it should also be noted that poor households did benefit from the expansion as well.

2. Did the new water system replace traditional water sources within the service area? First, it should be noted that treated water piped to individual households through the WD system in both urban centers is highly valued

because it is conveniently available and safe. Where residents can afford the total cost of using piped water for all their needs, they apparently abandon alternative sources. However, such residents are not in the majority in either Zamboanga City or Daet. Quite rightly, residents in both cities think of the security of their drinking water first; and it is clear that when WD water is available it replaces traditional sources of water at least for drinking. But the differential ability of households to pay for WD water makes traditional sources of water competitive, if only in providing water for other household needs than drinking.

3. Did the expansion of the Water District System "reduce the costs of water to the economy through reduction in medical expenses due to lower incidence of water-borne diseases, less time lost for education and work due to illness, avoidance of drilling private wells, and diversion of time spent for carrying water to more productive work"? This is obviously a very complex question that can only begin to be answered with the data collected for the present study. What is evident to the researchers is that the WD systems in both Zamboanga and Daet have taken reasonable steps to insure efficient delivery of potable water to residents in their respective service areas. On an a priori basis, therefore, they are contributing to the reduction of costs of water to the economy

through the varied benefits suggested in the question. Beyond this general observation, it is difficult to demonstrate from the data how specifically these benefits occur, although some discussion is presented on the incidence of waterborne diseases and the larger sanitary conditions in the two communities. Further, the goal of diverting time spent for carrying water to more productive use may not be very meaningful. Alternative sources of water, at least for certain uses, are highly competitive in costs; water procurement is considered an integral part of household tasks; and many households have surplus man-hours that are better utilized for work in obtaining less expensive (than WD system) water.

4. With regard to the three selected systemic issues, the following findings emerged:

a. In both urban centers studied, key informants and survey informants give positive ratings to the quality and efficiency of construction of the water system, the adequacy of the water provided and the efficiency with which water is delivered. This widespread approval of the three aspects of the system is in sharp contrast to the equally prevalent dissatisfaction with the water rates that household consumers are charged.

b. What determines household consumption of water? Is it household size and composition, or is it income status

of household? If the small quota sample of residents in both urban centers were representative of the populations in those centers, the answer is clearly the income status of the household. An interesting by-product of the survey findings in this regard is that there is a pronounced difference in water consumption between rich and poor households in Zamboanga compared with the difference in Daet.

c. The ZCWD and the CNWD made extensive use of the barangay assemblies, and related activities, as a channel for consultation between water district representatives and consumers. In most cases, consultation--or more precisely, communication--seems to have been largely one-way, that is, from WD officials to the larger population. WD representatives used these communication channels mainly to inform residents about the expansion projects and to solicit reaction to plans which had been formulated beforehand. One high point of public response within this type of consultative mechanism was the case of some barangay residents (in Daet) who suggested alterations (and the WD officials accepted the suggestion) in construction design. The radio has also been used by the Water District as a mechanism for disseminating information to local residents.

This one-way communication has been well-managed and has doubtless contributed to the positive image of the WD

systems in the two urban centers studied. The general lack of feedback information seems to have distressed no one. The expectation by Water District officials, City officials and the general public seems to be that consultation with the public would be low and would be confined to very specific matters such as the amount of charges for water. However, communicating general information seems to be considered as important.

Some Conclusions

As can be seen, the study attempted to cover a rather broad area. Each set of findings is obviously part of a larger whole; unfortunately, that whole does not consist only of the dimensions included in this study. Within the time set aside for the gathering of the empirical data and the writing of the report, the researchers did not have the chance to familiarize themselves with other aspects of the operation of the two Water Districts; for instance, how each system fits into the larger LWUA network, how LWUA operates and expects its constituent systems to operate, and what the fundamental economic assumptions are behind the operation of these systems. The conclusions that can be offered, therefore, will largely ignore the larger ramifications, except perhaps in an intuitive sense.

Some of the most important objectives of expanding the water systems in the two urban centers are suggested by the three questions posed earlier. To a certain extent these objectives were achieved. The poor did benefit from the expansion. Traditional water sources were replaced at least for certain uses by WD water as soon as this became available. Presumably, also, the cost of the water to the economy was offset somewhat by savings made possible through better health and the enhancing of facilities for obtaining potable water by the target population. Yet the poor benefited from the expansion only because they are everywhere; they are in the Poblacion where the expansion began, and they are in virtually every direction where the expansion could have proceeded to. The main thrust of the findings is not that the poor did not benefit from the expansion programs in the two cities; it is rather that not enough of them received the benefits, as the Project was designed to do. By the same token, the expansion of the water system made possible the availability of piped water for drinking especially and for general use as well, but only up to a point. Traditional sources, some of which yielded "safe" water, others of which did not continued to be competitive in overall costs and therefore in use. And, while it may be argued that the costs of securing treated water was reduced with the expansion of the

programs, it is also ^{arguable} agreeable that the reduction reached a level where the cost of piped water was generally affordable in terms of the budget of the larger population.

One is thus forced to look for explanations for the seeming deviation of the two systems under consideration from their original goals. The answer is provided in part by the data on two systemic issues that were examined. While respondents give positive ratings to the water system for various aspects of its performance, the water rates charged by both systems are all found to be unsatisfactory. Moreover, at the household level, there is a conscious attempt to limit the use of water, not so much according to need, as according to the ability of the household to pay the monthly water bills.

In brief, the achievement of financial stability seemed to have been the primary goal of each of the two systems under consideration. In the face of this priority, social priorities took the form of ideal, perhaps unrealistic goals.

Only one other set of findings needs to be commented on, and this has to do with consultative mechanisms. The ideal, of course, is maximal participation by the public in both the planning and implementation of the projects, and the one-way, highly circumscribed communication type of consultation adopted by the two Water District personnel

is far from the ideal. Yet achieving the ideal consultative model requires a number of crucial factors to be present, including a consensus among all participants on the value of a given consultative model itself. The form of consultation that took place in the two expansion projects is probably the lowest level of consultation and yet the most common level that most attempts at consultation reach. In this sense, the project officials and their constituents may be said to have achieved a realistic goal.

And Some Recommendations

1. From the findings and the conclusions, it is evident that achieving the specific welfare benefits originally designed for the expansion of the Project in each of the two cities depends to a great extent on whether or not the systems can be financially stable at the same time that social benefits assume their rightful priority. Reducing the problem to this level is the best that can be done by way of recommendation within the scope of this study. The more precise plan for achieving this objective will require more than simply sociological expertise and sociological data. But the researchers' own inclination is that the management of these systems should be given to groups (the present ones not necessarily excluded) who can present realistic plans for achieving these twin goals of

financial stability and maximum social benefits within a specified and acceptable period. Even if such a policy were adopted, the concept of "socialized pricing" will probably have to be made operable (if this is not the case already) not just at the level of the ultimate consumers but at the level of water districts as well. That is, water districts apparently vary in their potential for generating income from subscribers. Some districts like CNWD for instance, may take much longer than others before they become capable, if ever, of paying fully for the costs of the water that they generate and distribute, given their social objectives. For such districts, the realization of the twin goals of achieving financial stability while dispensing maximum social benefits may require a judicious balance of continuing if decreasing subsidy (from some general fund) and income generation from subscribers over a relatively long period of time.

2. Whether or not a significant change in policy is adopted, it is clear that the water charges in the two districts need to be re-examined, and the movement of water charges explored more fully in appropriate forums with local residents. Even if such forums do not produce acceptable options for lowering water charges the exercise should be helpful at least in making residents more aware of the costs involved in delivering treated water to their homes.

3. Increasing local accountability can also help in this twin goal of achieving financial stability while maximizing social benefits. This accountability cannot be achieved without raising the level of scope and efficiency of consultative mechanism in the two districts studied.

As indicated previously, the levels of consultations achieved by the two districts with their respective constituents are probably within the range that may

be expected under the circumstances. But much more can be done, with the first step simply aimed at making consultation a two-way communication process. Forming separate consultative groups, as was done in Zamboanga, is unlikely to be productive. Working with existing organizations at both the city/municipal and barangay levels would be more mutually beneficial. Relying on such local groups for fashioning consultative mechanisms may mean that the level of consultation will probably remain at the same level that other types of consultation handled by these groups are conducted. Moreover, issues involving water systems are just one set of community-wide issues that residents have to face. In brief, the level of consultation may continue to flounder on the low side.

But the WD has a unique opportunity to help raise levels of consultation, precisely because of the widespread belief that water system issues are largely technical and

therefore incomprehensible to the layman. To achieve success in this regard will call for affirmative action from WD personnel, not just their agreement in principle with public consultation or LWUA norms. There are technical aspects indeed that are better left to the engineers, but there is much room for public consultation. For one, the construction (or improvement) of a water system usually begins with a given source and a potential population of subscribers. The alternative uses of the source at different costs to the pool of potential subscribers could be discussed with the potential subscribers themselves. There are known cases where potential subscribers took the initiative of enlarging the potential subscriber population in order to reduce eventual individual household costs of subscription. In the present study, a decision is recorded of a WD diverting resources for expansion in one area to another area on the grounds that the alternative area promised a greater number of subscribers. This would have been one issue where a consultative body composed not only of Water District officials and the interested parties in the two competing areas but of representatives of the various areas in the whole district could appropriately have discussed and resolved. There may have been no difference in the decision arrived at either way. But the exercise would have contributed to more

informal, active and broad-based support for the WD. There are a host of other issues that WD officials and engineers might well be enlightened on if adequate consultation with people were undertaken. In any event, it still has to be shown that true consultative mechanisms in water system construction and management are unyielding of significant positive results. There simply have not been sufficiently genuine attempts to find out. Yet the experience in other areas--for instance in the construction and the management of water systems for irrigation--has demonstrated the positive contribution of effective consultative mechanisms. Hopefully, both WD officials and consumers in water districts would see its importance as well.

PROVINCIAL CITIES WATER SUPPLY PROJECT
POST-EVALUATION STUDY

Sociologist: Preliminary Terms of Reference

- 1) The aim of this Study component is to test the achievement of socio-economic benefits. More specifically, the Study shall examine whether or not Project facilities are achieving the social purposes anticipated by the Appraisal Report - for example: (i) "the Project is designed to expand the existing areas of supply into low income densely populated areas where the demand and need are greatest" (AR, para 139); (ii) "improve health by replacing unsafe shallow wells with piped treated water" (RRP, para 42); and (iii) reduce the costs of water to the economy through: reduction in medical expenses due to lower incidence of water-borne diseases, less time lost for education and work due to illness, avoidance of drilling private wells, divert time carrying water to more productive work" (AR, para 140) — The Study should also identify any unintended effects, including any environmental issues.

- 2) The analysis of social effects shall be based on existing data complemented where appropriate by a rapid reconnaissance survey of residents in at least two of the Project WDs. The range of information/ data could include:
 - (i) Spatial distribution of the water system, before and after the Project
 - (ii) Type of residential area by number of households connected and unconnected
 - (iii) Household size by connection status (or if neighbours share)
 - (iv) Water source by number of households and by household water use pattern
 - (v) Household income by number of households by connection status (and frequency of reconnection)
 - (vi) Household income by number of households intending and not intending to connect
 - (vii) Water consumption by household income and household size
 - (viii) Water bill by household income and household size

- (ix) Perceived benefits and problems by frequency of response
 - (x) Desired type of improvement by frequency of response
 - (xi) Sanitation facilities by connection status
 - (xii) Profiles of known consumer and non-consumer behavior in relation to health, water and waste disposal
 - (xiii) Water-related disease incidence by household connection status.
- 3) The Report shall describe the role of the WD community in Project design, implementation and operation — the effectiveness of consultative mechanisms and community education activities should be discussed and related to Project performance. The suitability of existing local organizations should also be mentioned.
- 4) The Report shall provide recommendations based on survey findings. Such recommendations should be useful and action-oriented. The draft Report shall be submitted by 27 July 1984.

Appendix A

RESEARCH METHODOLOGY

On 13 June 1984, a representative of the Asian Development Bank invited a sociologist from the Institute of Philippine Culture to undertake a social impact evaluation of the expansion programs in the Zamboanga City Water District (ZCWD) and the Camarines Norte Water District (CNWD). These expansion programs were part of a \$16 million loan package under the ADB's Provincial Cities Water Supply Project which was negotiated in 1976 and implemented from 1978 to 1982.

The main objective of the evaluation study was to ascertain whether or not the expansion programs in fact achieved their anticipated social purposes which, a Preliminary Terms of Reference enumerated, were as follows: 1) "to expand the existing area of supply into low income densely populated areas where the demand and need are greatest," 2) "improve health by replacing unsafe shallow wells with piped treated water," and 3) "reduce the costs of water to the economy through: reduction in medical expenses due to lower incidence of waterborne diseases, less time lost for education and work due to illness, avoidance of drilling private wells, divert time carrying water to more productive work." In addition, the Preliminary Terms of Reference required information on the consultative mechanisms employed by the water districts during and after the project, as well as beneficiaries' assessment of their services and water rates.

The Preliminary Terms of Reference also required a draft of the evaluation report to be submitted on 27 July, thereby giving the consultant approximately one month in which to conceptualize the research work, gather and analyze field data, and write and produce the research report.

Conceptualization

The most important constraint in the proposed evaluation was the lack of benchmark data. The second most important constraint was the time limit. Largely because of the second constraint a survey using a probability sample of respondents was rejected. Instead, it was decided that the primary data base would be built up through key informant interviewing.

Research problems. Having decided on the primary data source for the study, the scope of the research work specified in the Preliminary Terms of Reference were reduced to topics which could be handled more realistically within the limited timeframe. The more specific research problems were derived from the objectives of the Project, and were restated thus:

- (1) "Did the project, as designed, expand to densely populated low-income areas?"
- (2) "Did the new piped water system replace traditional water sources within the service area?"
- and (3) "Did connection to the WD in fact reduce the costs of water to the economy?"

Main research variables. The main research variables against which to examine the social impact of the expansion programs were income status and connection status. Connection status was determined with the assistance of the two water districts and the City (in the case of the ZCWD) or Municipal (in the case of the CNWD) Planning and Development Office which provided the list of barangays within and outside of the service areas.

Since income status, initially measured on a three-point ordinal scale (high, middle and low), could not be ascertained prior to the field data-gathering stage, key informants from the City/Municipal Planning and Development Office were relied upon to identify which barangays within and outside the service area could be considered high-income, middle income, or low income. This was checked against the information provided by key informants from the barangays covered by the study. In the course of key informant interviews, the terms for the three ranks were modified into the rich, middle, and poor to conform more closely with the informants' terminology and definitions (see text on social status). As defined with the assistance of key informants, the poor are those who constantly have difficulty in making ends meet without going into debt, the rich are those who have more than enough to meet their basic needs while the middle group consists of those who have just

enough. Respondents had relative ease in handling questions on this point. Most used a form of occupational evaluation in making their assessment.

It must be noted that the percentages of rich, middle, and poor households per barangay are based on estimates made by key informants and are therefore not expected to be precise figures. However, they are believed to be fairly reliable estimates in relative terms.

Research instruments

Two instruments were prepared for a field data gathering phase of the evaluation study. For the survey, the short questionnaire utilized in the evaluation of the Bogor Water Project was adopted and reformatted to conform with the standard IPC survey questionnaires. For the key informant interviews, a set of guidelines was formulated. To be used in unstructured interviews, this instrument specified the types of data to be collected from different types of key informants. For the survey (see Sources of Data, below) a modified form of the interview schedule used in the evaluation of the Bogor Water Project was prepared.

Sources of Data

Four sources of data were tapped to answer the research questions. Key informant interviewing, as indicated previously, constituted the main source; supplementary data were obtained from records, a quota sample survey data, and observation.

Key informant data. Key informant interviewing is an anthropological research method which relies heavily on relatively unstructured interviews with key informants as sources of significant research data. In key informant interviews, the informants are purposively selected for (a) their knowledge of the issues relative to the questions being asked, (b) their ability to speak about whole population categories (e.g., beneficiaries of water services; non-beneficiaries, etc.), and (c) the lack of any a priori reasons from the interviewer's view that the informants would conceal the truth. Depth key informant interviews can provide a wide range of qualitative data, including those that deal with processes. One major criticism of the method is that the data are not usually susceptible to statistical analysis.

An average of two key informants per barangay were interviewed in Daet and in Zamboanga City. In Daet, where 25 barangays were covered, a total of 48 key informants from barangays and different government agencies were interviewed. In Zamboanga City where 30 barangays were covered, a total of 67 key informants were interviewed.

(See text for the numbers and types of key informants.)

The key informants from the different barangays within and outside the service area were identified mainly with the assistance of the City/Municipal Planning and Development

Coordinator who provided a list of the barangay officials in the area. In turn, barangay officials and other influentials served as references for other key informants within the barangays.

In addition, key informants from the Water District, the City Health Office, and the City/Municipal Planning and Development Office were interviewed regarding the water system in the City as well as the health status of residents within and outside the service areas of the two water districts.

Records. Data on the number of service connections per barangay, census data, and statistics on the mortality and morbidity rates in the City were obtained largely from the Water District, the City Planning and Development Office, and the City Health Office, respectively. The water district offices were extremely generous in providing maps of the WD distribution system before and after the expansion project. In addition, the WD provided data on the number of service connections by zones, and in Zamboanga City, a WD key informant provided the research team as well with estimates of the percentage of household connections per barangay before (1976) and after (1983) the project. The City Engineer's Office also provided the research team with a map of Zamboanga City showing the different barangays. Unfortunately, the map

did not indicate barangay boundaries so it is the names of the streets which give the locations of the 30 barangays.

For Daet similar data were obtained from the Water District Office, the Rural Health Office and the Office of the Municipal Development Coordinator and that of the Municipal Mayor. There were several maps provided: the Schematic Plan map of the new water system was provided by the Water District and the detailed map of Daet, on which the Water District engineers generously made the proper notations and identification with regard to expansion and completion, was from the files of the Municipal Development Coordinator. The Marketing Officer and the Public Relations Officer of the Water District Office prepared a socioeconomic profile of the service area of WD.

Survey data. One hundred residents selected through quota sampling in four types of areas were interviewed in Daet and in Zamboanga. In each of the field sites, the 100 respondents were stratified according to social status (i.e., rich, poor, and middle) and connection with the water districts.

The survey respondents included 25 poor respondents from a poor community serviced by the WD, 25 rich respondents from a rich serviced community, 25 poor and not serviced, and 25 rich and not serviced.

Key informants from the ZCWD and the City Planning Office in Zamboanga City and the Municipal Development Coordinator and his staff in Daet, were largely instrumental in identifying the rich and poor connected and unconnected areas in which the survey was conducted. In Zamboanga City, serviced rich and poor respondents within the WD were taken from Bgys. Sta. Maria and Sta. Barbara, respectively, while the poor respondents in non-serviced areas were taken from Putik. In Daet, serviced rich and poor respondents within the WD were taken from Bgys. 7 & 3 of the Poblacion and Camambugan and from Borabod, Bagasbas and Mangtagbac, respectively; poor non-serviced respondents were taken from Awitan, Mambalite, and Cobangbang. Because there simply are no unserviced barangays which are composed mostly of rich residents, rich unconnected respondents were taken from various areas inside and outside the ZCWD and the CNWD.

Observation data. Observation data obtained during the course of key informant interviews and during ocular inspections of the various barangays covered by the study were used to augment and corroborate data gathered from the three preceding sources.

Focal unit of analysis

Barangays within and outside the service area of the water districts were decided upon as the focal unit of analysis of the study. The objective was to cover all the barangays serviced by the Water Districts and to sample as many of the barangays as possible outside but adjacent to the service area. In Zamboanga City, 21 barangays (4 barangays in the City Proper were taken as one) inside the service area and 9 barangays outside were included in the study. In Daet, 20 barangays inside the service area and 5 barangays outside were covered.

Research schedule

Given the time constraints, the plan was for the research teams to go to the field immediately. On 25 June, therefore, after one week of conceptualization, instrumentation, and field preparations, two teams each composed of a team leader (i.e., a Research Associate) and two research assistants, were dispatched to Zamboanga City and Daet. Field interviews were conducted (see field procedures below) from 26 June to 7 July 1984. Field data were analyzed and reports on the key informant interviews as well as the survey were drafted by each team from 9 to 16 July. The final report was written from 17-27 July.

Field Procedures

Upon their arrival in the field, and upon securing a lodging place in which to set up a base, each of the research teams immediately went about recruiting four local interviewers to assist in data gathering. In the case of the Daet research team, experienced interviewers were taken from the Research Services Center in Ateneo de Naga, Naga City. In Zamboanga City, the interviewers were selected from among 18 applicants recommended by the Ateneo Research Center of the Ateneo de Zamboanga. These interviewers were oriented about the survey to be conducted on the day they were recruited.

Calls were also made to the Water District and to the City/Municipal Planning and Development Coordinator to obtain data on the extent of the service area. With the assistance of key informants in these agencies, the barangays within and outside the service area were also determined following the scheme envisioned earlier. And to determine the barangays in which to conduct the survey, these key informants were also asked to point out which of the serviced and unserviced barangays had a predominantly poor population, and which had a predominantly rich population.

The survey began shortly afterwards. Interviews in each of the survey barangays in Daet and Zamboanga City were conducted as follows. From the barangay captain's house, the interviewers proceeded in four opposite directions.

Every fifth household which qualified as poor or rich, depending on the type of respondents to be interviewed in the particular area, was approached for interviews. If a particular household did not qualify (i.e., according to the size of the dwelling unit, the type of construction materials, and the state of repair), the interviewer then went to the next dwelling unit that qualified. In cases where the respondent had been interviewed and found later not to belong to the particular sample required from the barangay (e.g., as in the case of Sta. Barbara in Zamboanga City where about four households had high income because they receive remittances from family members who are contract workers abroad) substitutions were provided. The initial judgment on poor and rich status of survey respondents were later validated by income data. Results showed that those respondents considered rich on the basis of their dwelling unit's characteristics had much greater average monthly income than those considered poor. In Zamboanga, poor connected respondents earned from ₱200-2,600 or an average of ₱880 per month, while their rich counterparts earned ₱3,000-50,000 or an average of ₱9,320 per month. Unconnected respondents had somewhat lower incomes; poor respondents earned ₱170-1,300 or an average of ₱560 per month while rich respondents earned ₱4,000-20,000 or an average of ₱8,340 per month. In Daet, poor connected respondents earned ₱140-1,400

or an average of ₱690 per month, while their rich counterparts earned ₱700-32,400 or an average of ₱3,460 per month. Unconnected respondents also had generally lower incomes: poor respondents earned ₱62-1,000 or an average of ₱410 per month while rich respondents earned ₱200-2,000 or an average of ₱720 per month.

While the local interviewers went about conducting the survey under the supervision of one of the research team members, the two other team members commenced with key informant interviews in the barangays. After completing the survey, each member of the research team paired up with three of the local interviewers to cover all the 30 barangays of the study.* And while key informant interviews were being conducted, the fourth local interviewer tabulated the survey data.

After information had been gathered from all 30 barangays, the Zamboanga research team summarized all its findings using the categories provided by the key informant interview guidelines in large Manila paper. This summary enabled the research team to see at a glance the patterns of information gathered from the interviews, and to assess what types of information needed further verification.

* Only one barangay, Arena Blanco, was not visited by the research team; potential guides from the City Health Office did not think it safe for members of the research team to visit this area.

Visits were made once again to the Water District to collect additional data and, upon their request, to give a preliminary report of the findings of the field interviews, specifically the problems which people encountered with the Water District. The research team left Zamboanga City shortly afterwards.

In Daet the survey under the supervision of one of the team members was conducted simultaneously with the key informant interviewing done by the other two members of the team. The work proceeded rather fast in spite of the continuous rains. By the time the survey was finished, the team saw that there was no need to hire more key informant interviewers as the data gathering was almost completed. While the survey supervisor was making the initial tabulation and the drafting of tables, the two key informant interviewers continued with their activity.

Nightly meetings to thresh out the problems encountered in the field were conducted. During the first week, the presence of the four field interviewers proved to be a great help in ferreting observations about the areas covered during the day. One major advantage with the nightly session was the fact that for the areas not yet covered by the key informant interviewers, background data were already being provided. After the field interviewers left for Naga, the nightly discussions were conducted only among the three

members of the team. During this second phase, it was very common for the members to identify the gaps in the data gathering.

The last two days of the fieldwork were spent in making visits to the WD office and the municipal office to fill in the gaps in the data already gathered. Clarifications were also made during these visits to ascertain the correctness of the figures contained in the information already collected.

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The Research Staff acknowledges with thanks the Institute of Philippine Culture, Ateneo de Manila University, the Ateneo de Naga Research Service Center and the Ateneo de Zamboanga Research Center.