

THE RATE POLICY OF DAVAO CITY WATER DISTRICT: A CASE STUDY

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I. INTRODUCTION

The concept of waterworks development through the operation of a water district is a national experiment patterned after the Federal Water District of the United States. It is aimed at providing good water services on a self-sufficient basis in provincial urban centers having a population of more than 20,000.

Presidential Decree No. 198, as amended, authorized the formation of water districts at the option of local governments. The water district is mandated to operate independently on a self-supporting basis. To maintain its viability, the district is authorized by law to formulate and charge reasonable water rates to meet its cash requirements. Rates are set through a public hearing, a board resolution, and a review from the Local Water Utilities Administration (LWUA). The rates must be at levels capable of meeting the cost of operations, repair and maintenance, improvement and expansion, and a little reserve. Because it is free from any political subdivision of the government, subsidy to the water system, if any, is temporal. Therefore, if it is to meet its objectives as a public utility to operate with enough revenue, the water district has to adopt water rates *high enough to maintain viability and low enough to be within the ability of the majority of water consumers to pay*. To do this, the water district resorts to the cross-consumer subsidy, whereby the more affluent consumers pay a little more than less fortunate water users. This is reflected in the monthly minimum charges which vary according to the size and classification of connections. The basic commodity charge, however, remains the same for each type of consumer.

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In Davao City, there is inadequate water supply. The majority of the city's population get their water from rain, private carriers, or suppliers who charge from ₱0.20 to ₱0.30 per kerosene can (5 gallons or 20 liters) and/or from ₱10 to ₱15 per cubic meter. All freshwater suppliers in Davao charge ₱12 for one ton which is approximately one cubic meter. The Davao City water district charges vary from ₱1.55 to ₱4.65 per cubic meter. These figures show that the water district does not charge an excessive rate, but it does charge high enough to meet its financial requirements.

II. STATEMENT OF THE PROBLEM

This case study addresses the following research questions. (1) Who gets the water supply? (2) How much is the effective rate for water for the low, middle, and high income brackets? (3) Who pays more for water? (4) What is the variation between the different income brackets' effective rate and the water district's effective rate? (5) Is the intended subsidy for the low income group being realized? (6) What are the actual unit costs for water for different income brackets? (7) What are the available rate methods that can be recommended to correct deficiencies in existing rates?

III. METHODOLOGY

To answer the research questions properly, the following methods were used: (1) review and analysis of existing reports, records, and studies that relate to the case; (2) conduct of interviews with leading economists, government officials and leaders; (3) interview of a sample of customers; (4) utilization of existing data from the Slum Improvement Resettlement project (SIR) and Regional Cities Development Project (RCDP); and (5) retrieval of data in the customer ledger cards of the Davao City Water District (DCWD).

Research design. This study made use of the case study due to the unique feature of the pricing policy of the agency compared to the other water utilities in the country. A descriptive comparison of the frequency, mode, and percentages was used to better understand the differences among the low, middle, and high income groups. The data in this study are for the calendar period 1981.

Sample. The water district maintains a master list of customers

by area. Every fifth name was taken to be part of a sample. After a month of administering the method, the sample of 3,200 was reduced to 432, stratified according to low, middle, and high income groups within the large sample. The retrieval and consolidation of other data needed were done by the accounts custodian of the water district.

Research sites. Piapi and New Matina have a population of 2,000 households, with 685 being served by DCWD water. For sampling purposes, this area was considered the low income group. A sample of 136 households was taken. The results showed that the area's residents really belong to the low income group. The next area considered was the GSIS Village Subdivision, a middle income group area. The subdivision has 1,066 houses. A sample of 201 was identified to represent the middle income bracket. The third area considered was Juna Subdivision which has 480 houses. A sample of 95 was taken to represent the high income area. The site of the low income area is within the *poblacion*. The high income group, meanwhile, is three kilometers away from the downtown area whereas the middle income group is five kilometers away.

Water development rate structures. There are basically three kinds of rate computation available now in the country, namely: (1) the revenue unit concept (the rate guideline of LWUA used by the water district in 1973-77); (2) the socialized or quantity block method (a concept introduced by the consultant of LWUA, or the rates applied by MWSS) and (3) the optional or mixed revenue unit and socialized concept (the new rate guideline of LWUA since 1978 due to Presidential Letter of Instructions (LOI) 700). The cost of water service is generally expressed in cost per cubic meter of water used or delivered, as measured by the water meter. The monthly water (service) bill is therefore the product of the volume of water used and a unit rate, plus monthly minimum charge, if any.

Under the revenue unit method, the monthly water bill is the sum of the monthly minimum charge (which varies with the size of connection) and the commodity charge, which is calculated on the basis of a unit rate uniform for all connectors under the same classification. The Davao City Water District still uses this method of rate computation.

Under the quantity block method, the monthly water bill is the sum of all the charges calculated for each quantity block within the range of the total monthly water consumption, on the basis of each block's corresponding unit rate. Under this method, each block has

a different unit rate, increasing as the water consumption increases, but there is no monthly minimum charge. This method is used by the Metropolitan Waterworks and Sewerage System or MWSS in Metro Manila.

Under the combination or optional method, which was officially adopted by LWUA in 1978 as the standard method of water rate consumption to follow for all water districts, the monthly bill is the sum of the monthly minimum charge and all the charges for each quantity block within the range of total monthly water consumption.

Because of these varying unit rates per quantity block (consumption groupings of water users) and the monthly minimum charge, the following questions could be posed in evaluating a rate structure: (1) what is the basic unit rate? (2) what is the effective unit cost? (3) what is the actual unit cost of water?

Basic unit rate. The basic unit rate for water service is the *lowest rate* per cubic meter being charged by the district to its customers. This is also the basic rate for purposes of determining the allowable 60 percent increase in water rates under LOI 700. (1) Under the revenue unit method, this is equal to the rate per revenue unit (RU) after converting water consumption into revenue units. It is also equal to the uniform commodity charge for residential connections. (2) Under the quantity block method, it is the unit rate charged for the first quantity block for domestic/residential connections. (3) Under the combination or optional method, it is the unit rate charged for the first quantity block for domestic/residential connections.

Under any given rate schedule, the basic unit rate remains constant unless there is an approved change, after a review by LWUA. The monthly minimum charge — applicable in the revenue unit and combination methods, for which 10 cubic meters of water generally are given free in exchange for said monthly minimum charge — is not used in determining the basic unit rate.

Effective unit rate. The effective unit rate of water service is determined, irrespective of the method used in establishing the water rate schedule, by dividing the total collection over a certain period (month or year) by the total measured volume of water delivered to consumers over the same period. It is therefore the average rate per cubic meter of water actually billed and paid for, and is always higher than the basic unit rate. Another characteristic of the effective unit rate is that it may vary from one period to another, even if the same schedule of water rates is being used. This is be-

cause it is affected by a change in the consumption pattern of the low and high water consuming groups.

Actual unit cost. The actual unit cost of water is the average cost of water insofar as the water consumer is concerned and is determined by dividing the amount he has paid for the service by the measured volume of water he has consumed as indicated by the water meter over a specific period. This actual unit cost varies from one household to another, from consumer to consumer, and from period to period. From the viewpoint of the water district, this may be taken synonymously with the effective unit rate. Similarly, the actual unit cost of water for the water connector or user is the same as his effective unit cost. But it is not necessarily correct to say that the effective unit rate charged by the district is the same as the actual unit cost paid by a particular water consumer.

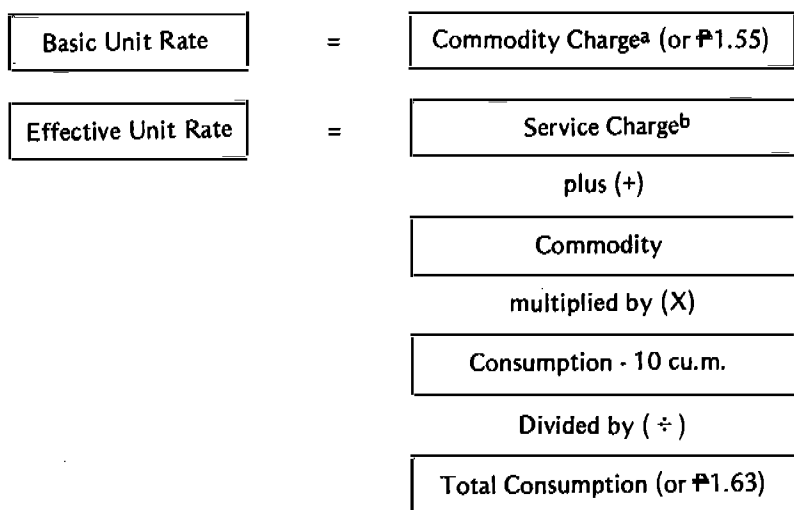
What is the difference between the basic cost of water and the effective unit rate? The difference is basically the actual cost, where the basic cost of water is based on a commodity charge while the effective rate considers the fixed and variable (service and commodity) charges and averages both to determine the rate to be paid. The basic unit cost considers the price fixed and multiplied by the variable consumption which gives the charged cost (see Figure 1).

What all this means to the water district. Under the present concept of water rate structuring to meet the financial needs of the district, the principle of economies of scale (wherein the more water one uses, the less the unit rate one pays) is applicable to water utility pricing if production is greater than the demand and it is available. An argument is made, however, for the reverse. The argument is based on the theory of viability and socialized pricing (cross-customer subsidy) whereby the more affluent (hence those who can afford to use more water) should pay more than the low income group. This tends to increase the effective unit rate without adversely affecting the water district's financial viability to lower the basic unit rate, and this can only be done by generating and having more connectors to the system.

IV. RESULTS AND FINDINGS

The basic unit rate is directly proportional to the cash requirement of the water district but inversely proportional to the number of its connectors (billed consumption). By keeping the cash requirements at a minimum and the number of paying consumers to a

FIGURE 1
KINDS OF CHARGES



Notes: The two terms can produce different results which are normally used by the water district in public hearings and rate-cost comparisons.

- a. The commodity charge varies in accordance with the volume of water actually used after the first 10 cubic meters delivered. The unit price is uniform for every size and type of connection.
- b. The service (or fixed) charge depends mainly on the size of connection and usually includes 10 cubic meters of "free" water. The service charge takes care of the so-called demand charge (availability of water when needed) and also implements the theory of making the "haves" partly subsidize the "have nots" by having the former pay a higher service charge.

maximum, the effective unit rate can be reduced to the lowest level possible. The basic unit rate in Davao city Water District is ₱1.55 per cubic meter for the residential and government connections, ₱3.10 per cubic meter for commercial and industrial users, and ₱4.65 per cubic meter for the bulk users or wholesalers (see Table 1). Note that the commodity charge in excess of ten cubic meters is the basic unit rate. The minimum varies as the size of the connection changes.

Table 2 answers the question of who gets the water. Some 40.31 percent of the household heads of Davao City water district

TABLE 1
DAVAO CITY WATER DISTRICT RATES AND CHARGES
 (Effective 1 May 1981)

<i>Size of connection (inches)</i>	<i>Government and residential (pesos)</i>	<i>Commercial and industrial (pesos)</i>	<i>Bulk or water sellers (pesos)</i>
0-3/8 ^a	14.00	—	—
0-1/2	39.20	78.40	117.60
0-3/4	62.70	125.40	118.10
1	125.40	250.80	376.20
1-1/2	313.60	627.20	940.80
2	784.00	1,568.00	2,352.00
3	1,411.20	2,822.40	4,233.60
4	2,822.40	5,644.80	8,467.20
6	5,644.80	11,289.60	16,934.40
Commodity charge			
per cu. m. in			
excess of 10 cu. m.	1.55	3.10	4.65

Source: Davao City Water District Schedule of Rates and Charges.

Notes: A discount of 10 percent will be credited to the customer's bill if he does not have any outstanding account with the water district before due date.

Service will be discontinued immediately if payment is not made five days after the due date of current bill.

A 3/8-inch connection is only allowed to low income families whose consumption does not exceed 15 cu.m. per month and two faucets. Consumption for three months exceeding 15 cu.m. will automatically be charged the 1/2-inch connection service charge.

earn from 0 pesos to ₱999 per month while 61.68 percent of the nonusers are in the same income bracket. The majority of those using the water system are earning more than ₱1,000 per month. But only a minority of Davao City household heads earn more than ₱1,000 per month.

The trend of the effective rate of Davao City water district (see Table 3) has been downward after 1978. This is due in part to a rapid expansion in the number of connections and customers and the stabilization of DCWD financial requirements. The average effective rate of DCWD for the last six years is ₱1.63 per cubic meter.

The effective rates for the low, middle, and high income group

TABLE 2
DAVAO CITY WATER DISTRICT
MONTHLY INCOME OF USER AND NONUSER HOUSEHOLD HEADS

<i>Income</i>	<i>User</i>		<i>Non-user</i>		<i>Total</i>	
	<i>frequency</i>	<i>Percent</i>	<i>frequency</i>	<i>Percent</i>	<i>frequency</i>	<i>Percent</i>
0-499	49	25.00	63	31.82	112	28.43
500-999	30	15.31	101	51.01	131	33.25
1,000-1,499	50	25.51	17	8.58	67	17.01
1,500-1,999	15	7.65	4	2.02	19	4.82
2,000-2,499	16	8.16	2	1.01	18	4.57
2,500-2,999	3	1.53	3	1.52	6	1.52
3,000-3,499	11	5.61	1	0.51	12	3.04
3,500-3,999	—	—	—	—	—	—
4,000-4,499	2	1.02	2	1.01	4	1.02
4,500-4,999	—	—	—	—	—	—
5,000 and up	13	6.63	1	0.51	14	3.35
Confidential	7	3.57	4	2.02	11	2.79
Total	196	100.00	198	100.00	394	100.00

Source: ESIA/WID Local Water Development Project Survey done by Ateneo de Davao Social Science Department.

TABLE 3
EFFECTIVE UNIT RATE OF DAVAO CITY WATER DISTRICT, 1976-81

<i>Item</i>	<i>1976</i>	<i>1977</i>	<i>1978</i>	<i>1979</i>	<i>1980</i>	<i>1981</i>
Total col- lection (P)	809,857	2,533,397	3,657,356	5,071,481	9,442,175	9,235,840
Total water consump- tion (m ³)	566,212	1,482,525	1,808,182	2,792,372	5,307,967	6,833,587
Effective unit rate (P/m ³)	1.43	1.70	2.02	1.81	1.77	1.35

Source: Davao City Water District Financial Operating Highlights, 1976-81.

according to the sample survey are found in Table 4. The effective rates by income group differ a lot.

A closer look into the consumption pattern of the low, middle, and high income groups is presented to understand who pays more for water. Table 5 tells us that 44.11 percent of the low income group consume from 0 to 10 cubic meters while there are only 12.94 percent in the middle income group and 5.26 percent in the high income group consuming less than 10 cubic meters. About 74.25 percent of the low income group consume from 0 to 15 cubic meters per month, while 30.08 percent in the middle and only 9.47 percent in the high income brackets have the same consumption.

Table 6 shows that 72.79 percent of the low income group, 24.88 percent of the middle income group, and 8.42 percent of the high income group are billed from the indigent minimum of ₱14.00 to ₱39.20. Some 62.73 percent of the middle income group are billed from ₱40.75 to ₱77.95 and 57.57 percent of the high income group are billed from ₱56.25 to ₱124.25. The billings give the impression that the low-income group pays less than the middle and high income group.

However, for the same brackets of consumption, the range of the effective rate could be derived (see Table 7). Table 7 shows

TABLE 4
EFFECTIVE UNIT RATE OF THE LOW-, MIDDLE-, AND HIGH-INCOME
BRACKETS IN DAVAO CITY WATER DISTRICT

<i>Item</i>	<i>Representative income class</i>		
	<i>Low</i>	<i>Middle</i>	<i>High</i>
Area	New Matina and Piapi	GSIS Subdivision	JUNA Subdivision
Average monthly collection (₱)	4,046.00	11,637.43	8,728.60
Average monthly consumption (m ³)	2,168	5,329	4,600
Effective unit rate (P/m ³)	1.86	2.18	1.89

Source: Davao City Water District customer ledger cards.

Notes: The effective unit rate official reported for CDWD was ₱1.63. The effective unit rate is equal to the average monthly collection divided by the average monthly consumption.

TABLE 5
CONSUMPTION PER DAVAO CITY WATER DISTRICT CUSTOMER
BY INCOME BRACKET

<i>Consumption (m³)</i>	<i>Low income</i>		<i>Middle income</i>		<i>High income</i>	
	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>
0-10	60	44.11	26	12.94	5	5.26
11-15	41	30.14	35	17.14	4	4.21
16-20	12	8.82	33	16.42	10	10.53
21-25	6	4.41	34	16.92	4	4.21
26-35	7	5.15	44	21.89	15	15.78
36-45	3	2.12	9	4.49	12	12.63
46-55	2	1.47	6	2.98	6	6.32
56-65	1	0.74	5	2.48	10	10.53
66-74	2	1.47	3	1.49	10	10.53
76-85	1	0.74	1	0.50	3	3.16
86-95	—	—	2	1.00	4	4.21
96-105	—	—	—	—	4	4.21
105 and up	1	0.74	3	1.49	8	8.42
Total	136	100.00	201	100.00	95	100.00

Source: Davao City Water District customer ledgers.

that 72.79 percent of the low income consumers pay from ₱1.40 to ₱3.90 per cubic meter while 62.1 percent of the middle income pay ₱2.22 to ₱3.70 per cubic meter of water, and 57.57 percent of the high income group pay from ₱1.91 to ₱2.67 per cubic meter of water. The high income consumers are paying less per unit of water than the poor who use less water, presumably because they could not afford to spend more.

V. SUMMARY

The paper has studied the rate policy of the Davao City Water District with special attention to a sample of low, middle and high income brackets for comparison and analysis to determine which group has been benefited by the rates. The intention has been to make the rate policy more responsive to the need of providing

TABLE 6
(AVERAGE BILLING BY INCOME BRACKET)

<i>Billing Bracket (pesos)</i>	<i>Low income</i>		<i>Middle income</i>		<i>High income</i>	
	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>
Less than 39.20	99	72.79	50	24.88	8	8.42
40.74- 46.95	13	9.56	30	14.93	8	8.42
48.50- 54.70	7	5.14	43	21.39	7	7.36
56.25- 62.45	4	2.94	23	11.44	10	10.53
64.00- 77.95	6	4.41	29	14.43	12	12.63
79.50- 93.45	1	0.74	9	4.48	10	10.53
95.00-108.95	2	1.47	5	2.48	11	11.58
110.50-124.45	1	0.74	4	1.99	12	12.63
126.00-139.95	2	1.47	3	1.49	3	3.16
141.50-155.45	—	—	3	1.49	2	2.11
157.00-170.95	1	0.74	—	—	4	4.20
172.50-186.45	—	—	—	—	1	1.05
188.45 and up	—	—	2	1.00	7	7.37
Total	136	100.00	201	100.00	95	100.00

Source: Davao City Water District customer ledgers.

TABLE 7
EFFECTIVE UNIT RATE

<i>Billing bracket (pesos)</i>	<i>Effective rate range (pesos)</i>
Less than 39.20	1.40-3.90
40.75- 46.95	3.70-3.13
48.50- 54.70	3.03-2.73
56.25- 62.45	2.67-2.49
64.00- 77.95	2.46-2.22
79.50- 93.45	2.20-2.07
95.00-108.95	2.06-1.98
110.50-124.45	1.97-1.91
126.00-139.95	1.90-1.86
141.50-155.45	1.86-1.82
157.00-170.95	1.82-1.79
172.50-186.45	1.79-1.77
188.45 and up	1.77-1.55

service to the low income group without undermining the viability of DCWD. The study shows that 41.82 percent to 52 percent are actually paying ₱2.73 per cubic meter, which is ₱1.10 higher than the district effective rate. Some 72 percent of these are in the low income group. In view of this the revenue unit concept rate policy is unfair to the low income group.

VI. RECOMMENDATIONS

1. A lower minimum charge should be considered. This will attract low users to the water supply. The minimum charge should include in its entitlement the necessary health and sanitary standard of 12 to 13 gallons of water per person per day.

2. A fixed percentage of the monthly household income should be a factor in computing what a customer can afford. An example would be the 3 percent household income of the low, middle, and high income brackets. This would mean a bill of ₱36.00 maximum for the low income, ₱75.00 for the middle-income, and ₱210.00 for the high income brackets.

3. The rate should also consider that the higher a consumer's income, the more a consumer could afford to buy fixtures which consume water. That consumer pays cheaper unit cost of water under the present rate policy. The rate should consider increasing the cost for every 20 cubic meters consumption to effect a graduated scale — i.e., the more you use, the more you pay.