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Water as a Business: Should Water Tariff Remain? Descriptive Analyses on Malaysian Households' Socio-Economic Background

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Abstract: Resilient community is achieved when each member takes responsibility on managing and consuming resources it has. In Malaysia, water demand increases as the public consumption increases. Low water tariff currently charged to the public has been identified to contribute towards public's inefficient water use. The literature suggests high tariff as a way to achieve efficiency. However this is a sensitive issue since water is considered a social good and human right. Thus, this study seeks to find out whether Malaysian households as water consumers perceive that water tariff charged should remain at its current rate. A survey was carried out on 1233 respondents coming from different upon socio-economic background (state, monthly income and level education). The study found that majority of them agreed that the current water tariff should remain as is. Majority of these respondents were found to have paid water bill which is RM20 and below and majority has not installed any water filter at home except for those with higher level of education and household income. The findings provide important insights on how Malaysian households thought about Malaysia's water pricing that will impact on the country's future policy planning.

Keywords: Socio-Economic Analysis, Water Tariff, Water Policy, Pricing, Water Quality, Water Business

INTRODUCTION

As direct users, Malaysian households are one of key stakeholders of the country's water industry. Managing water as a business entity has proven to be very challenging for the industry in particular the operators. One of the major challenges is managing the perception of Malaysian public in regards to water; in general, they considered water as a social good rather than an economic good (water is a human right and the government is responsible to provide the public with clean and safe water), and thus is not considered a business entity (1). To satisfy the public's expectations is also not easy as it is expected that tap water supplied to their

homes should be of high quality with acceptable organoleptic attributes, no health risk and should be well managed (1). Disappointing them can result in anger (1). Past local studies have even shown mixed results, some shown public's dissatisfaction and satisfaction with the quality of water provided (2, 3, 4). Literature shows that, the smell of the chlorine in water causes public dissatisfaction in Malaysia and United States of America (3, 5). While majority of the people in Kelantan were dissatisfied with the water quality that been supplied to their house (i.e. smell, colour and water condition) (6), it is different for Penang people as they were satisfied with their water quality (7). The problem is that water issues are not necessarily really understood by the public, as the perception is built upon their objective and subjective knowledge with the latter being superior most of the time (8). With increased costs in managing and improving infrastructure, water treatment, quality, and the like, the issue of water tariff increase is not avoidable. As explained by Abdul Wahid and Abustan (1: 96), "business in general funds most of their operation and other activities from the revenues generated by pricing" (1). This means finding accurate water pricing is deemed important. Overall, current water tariff charged in Malaysia has been very low (below RM1) with different charges observed from one state to another. Penang, Perak and Pahang are categorized as states with lowest charges (at 0.22, 0.30 and 0.37 sen/first 20m^3 respectively), Kedah, Perlis and Kelantan are states with medium charges (at 0.40, 0.40 and 0.45 sen/first 20m^3 respectively) while Johor, Malacca, Selangor/Wilayah Persekutuan and Negeri Sembilan are the states with high charges (at 0.80, 0.60, 0.57 and 0.55 sen/first 20m^3 respectively) (9). The low charges may have been reasons for why on average Malaysian households have been reported to pay only RM3.19 of their domestic bill per capita while they consume 202 litres per capita per day (10); Malaysia's water demand is also projected to show 63% increase from 11 billion m^3 in 2008 to 17.7 billion in 2050 (11). These findings indicate the importance of water tariff issue to be investigated. In line with this, the question on whether water tariff charged should remain at the current rate becomes the focus of this study. Any decision to increase or decrease the rate charged would have an impact on every stakeholder in the country particularly the households who would be directly affected. While increase of water tariff has been shown to be supported in some studies (14), other studies have also shown that this decision was not favoured (15). It is important to note that water tariff has been used in many countries as a policy tool to manage water consumption (12, 13). In Abu Dhabi for instance, water tariff increase implementation was aimed at reducing water consumption and improving water efficiency (14).

METHODOLOGY

This study applied a survey method on which more than 3000 questionnaires were distributed to household representatives all over Peninsular Malaysia (Sabah and Sarawak were not included). Their selections were based on them being paid water user and willingness to participate in the survey. Those who have agreed to participate will be handed a self-administered questionnaire. For the purpose of this article, only selected parts of the questionnaire will be analysed; namely, responses to item statement: "Water tariff should remain at the rate it is charged (no changes to current water tariff)", responses to demographic/socio-economic background information and all other behavioural related questions (water bill paid, number of water filter installed, water quality perception). In addition, responses to the statements have been recoded to a 3 point- from a 5- point Likert- scale; those answering strongly disagree (1) and disagree (2) are recorded to (1); while those answering neutral (3) are recoded into (2), and those who agreed (4) and strongly agreed (5) are recoded into (3). Data were analysed using cross-tabulation.

RESULTS

Out of 3000 survey questionnaires distributed, only 1233 (41.1%) were usable for further analyses. The other 1767 (58.9%) were either not returned or incomplete. Respondent's profile shown in Table 1 reveals that majority respondents were from Perlis (18.1%), with bachelor degree (39.2%), were from a household size of between four to seven persons (66.8%), and earning a household monthly income between RM 4001- RM 6000 (29.7%). Also, majority of the respondents paid their monthly water bill between RM20 and below (43%) and have no water filter (46.6%).

The overall analysis (Table 2) shows that majority of respondents (68%) agreed/strongly agreed that water tariff should remain at the current rate charged compared to those respondents who disagreed/ strongly disagreed (11.2%) or of neutral opinion (20.8%). Specific analysis based upon socio economic background of respondents, namely, household size (Table 3), household's monthly income (Table 5) and level of education (Table 7) show support for this finding as majority of respondents surveyed also agreed/ strongly agreed on this statement.

Further descriptive analysis made on household size as shown in Table 3 found that majority of each size category (1-3 persons, 4-7 persons, 8 and above persons) claimed water quality provided to them is in a good condition (74.9%). In the same table, those that come from medium water tariff charged (Kedah, Perlis and Kelantan) have 1-7 person in their house (39.4%) while those have 8 and above persons in their house come from high water tariff states (Negeri Sembilan, Malacca, Selangor/Wilayah Persekutuan and Johor) which is 2.9%. Table 4 shows that, majority of each household size category, namely, 1 to 7 paid their household water bill at RM20 and below (41.9%) except those who have eight and above family members paid their water bill RM 100 and above (1.8%). It is realistic for a household size of eight and above to pay their water bill more than RM100 and above because they used a lot of water. However, it is disturbing when a small size of household that consists of 1-3 persons paid their water bill more than RM 100 and above because it shows how heavy their water consumption is. Majority of the households; no matter what size they come from (46.6%) does not installed water filter at home as they believed the quality of water that is being provided to them is in a good condition (Table 4).

For household's monthly income, Table 5 shows that, the majority of respondents from each category, namely, RM2000 and below, RM 2001 - RM 4000, RM 4001 - RM 6000, RM 6001 - RM 8000, RM 8001 - RM 10,000, RM10,001 and above agreed that water tariff charge should remain as it is (68.0%) and the water quality that is being provided to them is in a good condition (74.9%). Majority of the households that earned RM2001-RM 8000 come from medium tariff charge states which is Kedah, Perlis and Kelantan (33.7%) while those households that earned RM 2000 and below; and RM 8001 and above come from high tariff charged states which is Negeri Sembilan, Malacca, Selangor/Wilayah Persekutuan and Johor (12.7%). Also, Table 6 claimed that majority of them paid their water bill around RM20 and below (43.4%). Most of the households did not install any water filter (39.0%) except those households that earn RM6001 to RM10000. These people claimed to have installed one water filter in their house (12.1%). According to (2), water filter can cost around RM 40 to RM4000. Thus, this may be the reason why people from high income level afford to installed water filter in their house even though they believe water that has been provided to them is in good condition.

Descriptive analysis made for each level of education, namely, PhD/ Master, Bachelor, Diploma/ certificate, Secondary School and below found majority of each category also agreed/ strongly agreed that

water tariff charge should remain as it is (68.1%) and they believed that water provided to their house is in a good quality (74.9%) as shown in Table 7. Majority of the respondents that have Certificate and onwards, come from medium water tariff states; which are Kedah, Perlis and Kelantan (36.7%). Meanwhile, those who attended Secondary school and below, come from low water tariff which are Penang, Perak and Pahang (8.9%). Table 8 shows that the majority of the respondents paid water bill around RM20 and below (43.5%) and those who come from high education background, which are, from Bachelor degree onwards reported that they installed one water filter at home (22.8%). Meanwhile those from lower education background did not install any water filter (28.1%). According to (8), those people that have objective knowledge about how dangerous contamination and bacteria can be, may be one of the reasons why they installed water filter in their house. Therefore, based on these facts, it able to strengthen the point where people who have high level of educations tend to installed water filter in their house.

Table 1
Respondents' Profile

Demographic	*Category*	*Frequency*	*Percentage (%)*
State	Johor	86	7.0
	Perak	156	12.7
	Kedah	175	14.2
	Perlis	223	18.1
	Kelantan	115	9.3
	Melaka	110	8.9
	N. Sembilan	119	9.7
	Pahang	22	1.8
	W. Persekutuan	29	2.4
	Penang	127	10.3
	Selangor	71	5.8
missing		0	0
Education level	PhD	23	1.9
	Master	133	10.9
	Bachelor	479	39.2
	Diploma /Certificate	318	26.1
	Secondary school and below	270	22.1
missing		10	0.8
Number of Household	1-3	332	27.0
	4-7	820	66.8
	8 and above	76	6.2
missing		5	0.4
Income	RM 2000 and below	152	12.4
	RM 2001- RM 4000	310	25.3
	RM 4001- RM 6000	364	29.7
	RM 6001- RM 8000	189	15.4
	RM 8001- RM 10 000	129	10.5
	RM 10 001 and above	81	6.6

contd. table 1

Demographic	*Category*	*Frequency*	*Percentage (%)*
missing		8	0.6
Water bill statement	RM 20 and below	519	43
	RM 21-RM 40	330	28
	RM 41-RM 80	225	19
	RM 81-RM 100	57	4.8
	RM 101 and above	66	5.5
missing		36	2.9
No of water filter	0	563	46.6
	1	447	37.0
	2	162	13.4
	3	16	1.3
	4 and above	20	1.7
missing		25	2.0

Table 2
Responses on whether water tariff charged should remain as it is

Water tariff should remain at the rate it charged	*Frequency*	*Percentage (%)*
Strongly Disagree /Disagree	128	10.4
Neutral	238	19.3
Agree / Strongly agree	776	63.0
Total	1142*	92.7

*91 (7.3%) of respondents did not answer this question.

Table 3
Cross-tabulation of household's size with responses on whether water tariff charged should remain as it is, water quality and water tariff charged (states)

Household size	*Level (%)*			*Water quality*			*Water tariff charged (states)*		
	Strongly Disagree/ Disagree	*Neutral*	*Agree / Strongly agree*	*poor quality*	*Neutral*	*Good quality*	*Low (Penang, Perak and Pahang)*	*Medium (Kedah, Perlis and Kelantan)*	*High (Negeri Sembilan, Malacca, Selangor/WP and Johor)*
1-3	26 (2.3%)	51 (4.5%)	222 (19.5%)	28 (2.3%)	52 (4.3%)	249 (20.4%)	93 (7.60%)	123 (10.00%)	116 (9.40%)
4-7	93 (8.2%)	171 (15.0%)	511 (44.8%)	76 (6.2%)	123 (10.1%)	615 (50.5%)	200 (16.20%)	361 (29.40%)	259 (21.10%)
8 and above	8 (0.7%)	16 (1.4%)	43 (3.8%)	14 (1.1%)	13 (1.1%)	48 (3.9%)	11 (0.90%)	29 (2.40%)	36 (2.90%)
Total	127 (11.1%)	238 (20.9%)	776 (68.0%)	118 (9.7%)	188 (15.4%)	912 (74.9%)	304 (24.80%)	513 (41.80%)	411 (33.50%)

Table 4
Cross-tabulation of household's size with reported water bill and number of water filter installed

Household size	*Reported water bill paid (RM)*					*No of water filter installed (unit)*			
	20 and below	*20-40*	*40-60*	*60-80*	*100 and above*	*0*	*1*	*2*	*3 and more*
1-3	165 (13.80%)	100 (8.30%)	38 (3.20%)	5 (0.40%)	16 (1.40%)	179 (14.8%)	96 (7.9%)	45 (3.7%)	2 (0.20%)
4-7	337 (28.10%)	215 (18.00%)	115 (9.60%)	48 (4.00%)	85 (7.00%)	344 (28.5%)	328 (27.2%)	110 (9.1%)	29 (2.40%)
8 and above	17 (1.40%)	15 (1.20%)	11 (1.00%)	7 (0.60%)	22 (1.80%)	40 (3.3%)	23 (1.9%)	7 (0.6%)	5 (0.40%)
Total	519 (43.40%)	330 (27.60%)	164 (13.70%)	60 (5.00%)	123 (10.30%)	563 (46.6%)	447 (37.0%)	162 (13.4%)	36 (3.00%)

Table 5
Cross-tabulation of household's monthly income with responses on whether water tariff charged should remain as it is, water quality and water tariff charged (states)

Monthly Income	*Level (%)*			*Water quality*			*Water tariff charged (states)*		
	Strongly Disagree/ Disagree	*Neutral*	*Agree / Strongly agree*	*poor quality*	*Neutral*	*Good quality*	*Low (Penang, Perak and Pahang)*	*Medium (Kedah, Perlis and Kelantan)*	*High (Negeri Sembilan, Malacca, Selangor/WP and Johor)*
RM2000 and below	19 (1.7%)	25 (2.2%)	87 (7.6%)	20 (1.6%)	27 (2.2%)	103 (8.5%)	52 (4.20%)	39 (3.20%)	61 (5.00%)
RM2001 - RM4000	33 (2.9%)	62 (5.4%)	213 (18.7%)	22 (1.8%)	58 (4.8%)	230 (18.9%)	77 (6.30%)	137 (11.10%)	96 (7.90%)
RM4001 - RM6000	42 (3.7%)	82 (7.2%)	219 (19.2%)	38 (3.1%)	68 (5.6%)	254 (20.9%)	68 (5.60%)	200 (16.30%)	96 (8.00%)
RM6001 - RM8000	12 (1.1%)	33 (2.9%)	129 (11.3%)	16 (1.3%)	19 (1.6%)	152 (12.5%)	48 (4.00%)	77 (6.30%)	64 (5.20%)
RM8001 - RM10,000	13 (1.1%)	21 (1.8%)	80 (7.0%)	9 (0.7%)	8 (0.7%)	112 (9.2%)	34 (2.80%)	36 (2.90%)	59 (4.90%)
RM10,001 and above	8 (0.7%)	15 (1.3%)	47 (4.1%)	13 (1.1%)	8 (0.7%)	60 (4.9%)	24 (2.00%)	22 (1.80%)	35 (2.80%)
Total	127 (11.1%)	238 (20.9%)	775 (68.0%)	118 (9.7%)	188 (15.4%)	911 (74.9%)	303 (24.80%)	511 (41.70%)	411 (33.60%)

Table 6
Cross-tabulation of household's monthly income with reported water bill and number of water filter installed

Monthly Income	*Reported water bill paid (RM)*					*No of water filter installed (unit)*			
	20 and below	*20-40*	*40-60*	*60-80*	*100 and above*	*0*	*1*	*2*	*3 and more*
RM2000 and below	71 (5.90%)	23 (1.90%)	17 (1.40%)	15 (1.30%)	16 (1.30%)	100 (8.30%)	31 (2.60%)	14 (1.20%)	4 (0.40%)
RM2001-RM4000	139 (11.60%)	98 (8.20%)	44 (3.70%)	17 (1.40%)	8 (0.70%)	164 (13.60%)	104 (8.60%)	30 (2.50%)	2 (0.20%)
RM4001 - RM6000	155 (13.00%)	109 (9.10%)	31 (2.60%)	41 (3.40%)	20 (1.70%)	170 (14.10%)	139 (11.50%)	43 (3.60%0	9 (0.70%)
RM6001 - RM8000	90 (7.50%)	51 (4.30%)	28 (2.30%)	9 (0.80%)	6 (0.50%)	49 (4.10%)	92 (7.60%)	38 (3.20%)	7 (0.60%)
RM8001 - RM10,000	39 (3.30%)	34 (2.80%)	31 (2.60%)	17 (1.40%)	7 (0.60%)	41 (3.40%)	54 (4.50%)	26 (2.20%)	7 (0.50%)
RM10,001 and above	24 (2.00%)	14 (1.20%)	13 (1.10%)	18 (1.50%)	9 (0.80%)	36 (3.00%)	27 (2.20%)	11 (0.90%)	7 (0.50%)
Total	518 (43.4%)	329 (27.6%)	164 (13.7%)	117 (9.8%)	66 (5.50%)	560 (43.40%)	447 (27.60%)	162 (13.70%)	36 (9.80%)

Table 7
Cross-tabulation of household's education level with responses on whether water tariff charged should remain as it is, water quality and water tariff charged (states)

Education level	*Level (%)*			*Water quality*			*Water tariff charged (states)*		
	Strongly Disagree/ Disagree	*Neutral*	*Agree / Strongly agree*	*poor quality*	*Neutral*	*Good quality*	*Low tariff (Penang, Perak and Pahang)*	*Medium tariff (Kedah, Perlis and Kelantan)*	*High tariff (Negeri Sembilan, Malacca, Selangor/WP and Johor)*
PhD/ Master	12 (1.10%)	31 (2.70%)	113 (10.00%)	6 (0.60%)	14 (1.20%)	135 (11.10%)	30 (2.50%)	68 (5.50%)	58 (4.80%)
Bachelor	46 (4.00%)	95 (8.30%)	334 (29.30%)	21 (1.7%)	76 (6.3%)	382 (31.5%)	106 (8.70%)	237 (19.40%)	136 (11.10%)
Diploma/ certificate	32 (2.80%)	73 (6.40%)	192 (16.90%)	35 (2.9%)	55 (4.5%)	224 (18.5%)	57 (4.70%)	145 (11.80%)	116 (9.50%)
Secondary School and below	37 (3.20%)	37 (3.20%)	137 (12.00%)	55 (4.5%)	42 (3.5%)	168 (13.8%)	109 (8.90%)	62 (5.10%)	99 (8.10%)
Total	127 (11.20%)	236 (20.70%)	776 (68.10%)	118 (9.7%)	187 (15.4%)	909 (74.9%)	302 (24.70%)	512 (41.90%)	409 (33.40%)

Table 8
Cross-tabulation of household's level of education with reported water bill and number of water filter installed

Education level	*Reported water bill paid (RM)*					*No of water filter installed (unit)*			
	20 and below	*20-40*	*40-60*	*60-80*	*100 and above*	*0*	*1*	*2*	*3 and more*
PhD/ Master	86 (7.20%)	32 (2.70%)	21 (1.80%)	5 (0.40%)	10 (0.90%)	55 (4.6%)	61 (5.1%)	35 (2.9%)	3 (0.2%)
bachelor	198 (16.60%)	155 (13.00%)	49 (4.10%)	19 (1.60%)	44 (3.70%)	167 (13.9%)	213 (17.7%)	70 (5.8%)	20 (1.7%)
Diploma/ certificate	132 (11.10%)	87 (7.30%)	44 (3.70%)	16 (1.30%)	32 (2.70%)	151 (12.6%)	116 (9.6%)	37 (3.1%)	10 (0.8%)
Secondary and below	102 (8.60%)	54 (4.50%)	49 (4.10%)	20 (1.70%)	37 (3.10%)	186 (15.5%)	56 (4.7%)	20 (1.7%)	3 (0.2%)
Total	518 (43.50%)	328 (27.50%)	163 (13.70%)	60 (5.00%)	123 (10.30%)	559 (46.5%)	446 (37.1%)	162 (13.5%)	36 (3.0%)

CONCLUSION

The descriptive analyses made on respondents' socio-economic background provide important insights for drinking water industry on charges of water tariff. From the results, it can be concluded that Malaysian households would want the water tariff charged at the current rate. Thus, water tariff charge should not be increased. The study also found that the respondents were confident on quality of water supplied to their homes. In Addition, majority of the respondents paid their water bill RM 20 and below except those who have 8 and above family members, paid their water bill RM 80 and above. Some of the household, installed water filter in their house come from RM6001 to RM10,000 monthly income and have high level of education (bachelor, PhD or Master). This study helps policymakers to make decisions based on the public's perception towards water condition in Malaysia.

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