

**WILLINGNESS TO PAY FOR QUALITY IMPROVEMENT OF PDAM TIRTAMARTA IN
YOGYAKARTA CITY:**

Contingent Valuation Method Approach

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ABSTRACT

The purpose of this research is to analyze the factors that influence willingness to pay of household customers to improve the quality of PDAM Tirtamarta in Yogyakarta City. This research used contingent valuation method (CVM), which was measured by the value of willingness to pay (WTP). Data collection techniques of 308 respondents in this research used dichotomous with direct interviews and binary logistic regression, the research found that 88% of respondents were willing to pay for quality improvement of PDAM Tirtamarta, the variables of income, education, water quality, and customer satisfaction significantly influence the willingness to pay, whereas the variables of house ownership and the family members have no effect on it.

Keywords: *willingness to pay; contingent valuation method; quality improvement.*

INTISARI

Tujuan dari penelitian ini adalah menganalisis faktor faktor yang mempengaruhi willingness to pay pelanggan rumah tangga untuk perbaikan kualitas dari PDAM Tirtamarta di Kota Yogyakarta. Metode yang digunakan dalam penelitian ini adalah contingent valuation method (CVM), dengan menggunakan metode ini dapat diukur besarnya nilai willingness to pay (WTP). Teknik pengumpulan data dalam penelitian ini menggunakan dichotomous dengan wawancara langsung untuk 308 responden. Hasil uji regresi binary logistic menunjukkan bahwa sebesar 88% responden bersedia untuk membayar perbaikan kualitas dari PDAM. Variabel pendapatan, pendidikan, kualitas air dan kepuasan pelanggan berpengaruh secara signifikan untuk willingness to pay, sedangkan variabel kepemilikan rumah dan jumlah tanggungan tidak berpengaruh untuk willingness to pay.

Kata kunci: *willingness to pay; contingent valuation method; quality improvement.*

INTRODUCTION

Water is one of the natural resources that important to human life. Water can also be used in all activities of life in the term of commercial and non-commercial. Water becomes a vital resource for human beings because any activity that is carried out cannot be detached from water, as for daily consumption, household needs, the needs of industry, agriculture, recreation and etc. Indonesia is a country that has a lot of population and Yogyakarta City is one of the city that growing rapidly in line with progress in some sectors such as student city and tourist attractions, they are certainly increase a lot of newcomers to learn, business or sightseeing in Yogyakarta.

Management of clean water services for the needs of Yogyakarta City community implemented by Tirtamarta Municipal Water Company (PDAM) Yogyakarta. PDAM Tirtamarta is a public service provider that has a role in clean water management for the benefit of the people in the area of Yogyakarta City. PDAM Tirtamarta as one of the Regional Owned Enterprises in Yogyakarta City needs to provide good service in an effort to increase customer or community's satisfaction as user in quality, quantity and continuity. Clean water service is an absolute perceived by the customers of PDAM. Similar to that perceived by PDAM in other urban cities, then problem that occur in PDAM Tirtamarta is water loss of level (Non-Revenue Water), this happened because of the existence of leaking pipes that make water wasted.

Quality improvement in this research is the replacement of leaking pipe into a new pipe. Quality improvement is included in non-market goods. Non-market goods are a group of goods and services whose quantity or quality are not traded in the market, and also have no explicit monetary value in currency units or have no price market, so need for identification of non-market goods in order to place the monetary value on the goods (Patunru et.al, 2004). The method of economic valuation for non-market goods in this research used contingent valuation method (CVM).

According to Yakin (1997) the superiority in CVM is the only technique for estimating the benefits that can be applied to various contexts to assess environmental policies and can be used in assessing environmental conservation and environmental policies. The CVM method allows that all commodities not available in the market, where all these commodities have no economic value, but with this model makes all commodities that are

not available in the market have economic value, and can be measured. Thus the economic value of a public good can be measured using willingness to pay (WTP). The problem of a pipeline leak that occurred in the Yogyakarta City caused the wastage of water in useless, the improvement of pipeline facilities is a problem in almost every PDAM. The problem of pipeline leakage will be a problem that can happen every year, the only way out is to replace the damaged pipes with new pipes.

RESEARCH OBJECTIVES

1. Measuring the magnitude value of willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.
2. Identify the influences of family income variable on willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.
3. Identify the influences of education on willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.
4. Identify the influences of house ownership variable on willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.
5. Identify the influences of the family member variable on willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.
6. Identify the influences of water quality variable on willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.
7. Identify the influences of customer satisfaction variable on willingness to pay for quality improvement of PDAM Tirtamarta in Yogyakarta City.

THEORITICAL FRAMEWORK

A. The Characteristics of Water Resources

The water in this sense includes surface water, groundwater, rain water, and the sea water is utilized on ground. While, the notion of water resources is the water and all the potential contained in water, water

sources, including the irrigation facilities and infrastructure can be utilized, but does not include animal wealth that exist there in (Sunaryo, 2004).According Sanim (2003) water as a natural resources may be preparation and at the same time as the flow. Ground water, for example is the inventory that usually require flow and charging back by rain water. Water intake depends on the topographic and meteorological conditions, since both affect the process of absorption and the evaporation of water.

B. Water Availability and Water Needs

Water availability and water needs are includes natural resources that has vital function to the human life which exist in advance of this earth. The explanation indicates that water has a very strategic role and should remain available and sustainability, then have capability to supporting life and the implementation the development in the present or in the future because of the absence of water then life wouldn't be able to walk. The needs of clean water depends on types of necessary is kick all of human activity. According from Kodoatie and Sjarief (2005), are as follows:

1. Domestic water needs, i.e. is the needs of water used a household. This water is determined by the needs of population and per-capita consumption. Population trends and the history of population is used as the basis of calculation of the domestic water needs especially in the determination of the trend rate of growth.
2. Non-Domestic water needs, i.e. the needs of water that conducted of commercial benefits, institutional needs, and industrialization needs. Commercial water needs for a given area tend to increase line with the increase in population and changes in land use. Institutional needs include the water needs for schools, hospitals, government buildings, places of worship and others.

C. The Development of Water Resources

The development of water resources played a role in the complex process of taking decision. Not only economic efficiency to be attention, but also the regional development, the quality of the environment, the distribution of benefits and costs, as well as other dimensions of human welfare as explicit destination that

must be reached by decision making, therefore the complete information with sharp analysis and integrated need to be presented by the decision makers (Sanim, 2011). Vision and mission in the national development of water resources in Kodoatie and Sjarief (2005) are as follows:

1. The Vision of the national water resources controlling; development and controlling water, land, and related resources that are sustainability and environmentally for welfare society.
2. The Mission of national water resources management is as follows:
 - a. Conservation water resources for sustainability water resources.
 - b. Proper water utilization fair, efficient, and effective.
 - c. Guarantee the availability of water for agriculture needs of the people.
 - d. Management of integrated water-related disasters (floods, landslides, drought, and etc)

D. The Management of Water Resources

Some problems related to the lack of water resource management in Indonesia according to Sanim (2011), among other things:

1. The existence of the fragmentation of management between government agencies of the Republic of Indonesia and the difficulty of coordination between various agencies in managing water resources.
2. Management of water resources are still limited and oriented only on the side of the provision rather than on the side of sheer necessity.
3. The extravagant use of water for agriculture because of the low efficiency of the use of water for agriculture. As a user of 80-90 percent of all water users, the agricultural sector estimated water for effective plant growth only 50-60 percent, the rest is lost while streaming in channels pooled not optimal in the area of rice fields. If the currently allocated to irrigation water of around 4.000 cubic meters per second, then the increase in efficiency by about 10 percent alone would save meters of water per second.

4. Organization management of water resources still centralized in the Central that has not been decentralization although the autonomous region has proclaimed since 2000
5. The low level of society in the managing water resources on one side and on the other side is still not much involve the participation of local communities in the management of organizations.
6. Distribution of water services is uneven. The distribution more focused to serve the commercial activities that support economic development. Only consumers who capable to pay have access of clean water.
7. Water pollution that causes water in Jakarta and other major cities is not suitable as drinking water since water resources have been polluted, as the presence of bacterial content of coli in ground water.
8. The unsuitable of the Indonesia Government to expand its network of irrigation for agricultural purposes, so decreasing the production of rice.
9. The decreasing of water supply, even for clean water or drinking water causes depletion of catchment land over the function result.

E. The Economic Value of Water Resources

According to Fauzi (2006), water also has intrinsic value and its utilization has added value because of the extraction to utilization directly gives consumption rise to costs which are quite substantial. Like other environmental goods and services, the value of water derived from the importance and contribution of water for humans and other living beings. The value of water can be identified from the role of water include the following:

1. The source of life (physiological need) for all living things, especially human (provisioning services)
2. Provide indirect benefits such as intermediate inputs in the production process, especially for the agricultural sector such as irrigation and industry, as well as maintain ecological processes and function ;
and

3. Used for recreation, aesthetic, social and religious (cultural services). From the economic point of view, the role of the water can be summarized into three kinds, namely as final goods for consumption, intermediate input for production, and a provider of environmental and ecosystem.

F. Public Goods

According to Mangkoesoebroto (1993), public goods are goods which in the consumption by a specific individual will not reduce the consumption of other people of that good. An item is public goods that cannot be restricted to whom its use and as much as possible even someone does not need to expand money to get it. Public goods are to society in general (overall), so that from all sides of life can enjoy it. Public goods have characteristics that differentiate it from other items, namely:

1. Non Exclusive

If a public goods available, no one can dissuade anyone to get benefit from the goods or in other words, everyone has access to the item. So whether the person is willing to pay in consuming the goods or services he continues to get benefit.

2. Non-Rival

In the use of public goods mean that the consumer use to a goods will not reduce the chances of other consumers to consume the item.

3. Joint Consumption

Goods or services can be used or consumed together. A goods or services can be said to have a high consumption level joint if the goods or services can be consumed together simultaneously in the same time (joint consumption) without negating the benefits between one user with other user.

4. Externalities

Externalities are a side effect of certain parties to an action against the other party, the impact of advantages or disadvantages. Externalities will occur if the public get the impact or effects of certain outside goods or services that are directly related to the mechanism of the market.

G. Valuation Economy

Economic valuation in general is providing a quantitative value of a goods and services produced by the natural resources and environment, regardless of whether the market value available or not (Susilowati, 2002). Economic valuation is a way that can be used in determining the quantitative value of goods and services produced by the environment and natural resources. Based on the analysis of non-market economic valuation can be used in terms of giving monetary value to products and services that are not marketed/ non-market goods.

Environment as a public good is a thing that can't be measured physically-quantitative so it is difficult to judge with monetary or money forms, but very clearly the environment is a much-needed commodity. In other words, the environment is non-market goods. According to Patunru et.al (2004), non-market goods is a group of goods and services that the number or quality of goods is not traded in the market. This means that non-market goods are goods and services that do not have market prices. In some literature mentioned non-market goods are often ignored and given inaccurate weight, whereas the goods provide considerable benefits in the community, so it needs to identify the non-market goods in order to place the monetary value on the goods.

H. Contingent Valuation Method

Contingency valuation (Contingent Valuation Method, CVM) is a method of calculating directly, in this case directly asking the willingness to pay to the society by assessing individual heavy point objects public goods on the standard money value (Hanley and Spash, 1993)

According to Fauzi (2006), CVM is a strongly method depends on the hypothesis that will we built, for example the extent of the costs to be born, how payment and so on. CVM method is technically can be done in two ways, namely through simulation and experimental technical engineering survey. CVM method is often used to measure the value of passive or natural resources are often also known as the value of existence. CVM methods essentially aim to find out the wishes of pay from the public of environmental improvement and a desire received compensation of environmental damage.

I. Dichotomous Choice CVM

One of the most public CVM model used is a dichotomous model. This approach considered to the other models, such as open ended game or bidding game. In the year 1980-90s realized the existence of weaknesses on the model of open ended and bidding game in terms of estimating the value of the appropriate WTP because the method requires respondents to construct the maximum WTP that often in the end give rise bias (Fauzi, 2006)

Dichotomous choice CVM method that is offered to respondent a certain of money and ask whether the respondent want to pay or not such a sum of money to obtain the improvement of environmental quality through the payment of environmental services. This method makes it easy for respondents to more understand the intent and goals of research compared to other method. This method makes easily to classification of respondents who have a tendency to pay for improvements to the environment and who did not have a tendency to pay for environmental improvements.

J. Willingness to pay

According to Hanley and Spash (1993), Willingness to pay is environmental conditions or value of natural resources and natural services in order to improve the quality of the environment. In willingness to pay calculated how far the ability of every individual or society in the aggregate to pay or spend money in order to improve the environmental conditions to suit the desired condition. Willingness to pay is one part of the method of Contingent Valuation Method that used in this research.

RESEARCH METHODOLOGY

A method which performed in this study is quantitative method. The subject of this research are the respondents of PDAM Tirta Marta household customers in Yogyakarta City who are still active without distinguishing the customer tariff class. The dependent variables are family income, education, house ownership, the family members, water quality, and customer satisfaction. While the dependent variable is willingness to pay. The data used in this research is the primary data and secondary data. The method and data analysis data used contingent valuation method (CVM) and binary logistics regression model.

RESEARCH FINDINGS

A. Descriptive Statistics Analysis

Based on the results of research conducted by researchers, the following descriptive statistic of variables in this research can be seen in detail in Table 5.1:

Table 5.1
Descriptive Statistic of Variables

	N	Minimum	Maximum	Mean
WTP (Willingness to pay)	308	,00	1,00	,8766
INC (Income)	308	500000,00	7500000,00	1750746,7532
EDU (Education)	308	6,00	16,00	12,0812
OWN (House Ownership)	308	,00	1,00	,8701
FAM (The family members)	308	,00	7,00	2,3669
WQ (Water quality)	308	,00	1,00	,6818
SCUST (Satisfied Customer)	308	,00	1,00	,6526
Valid N (listwise)	308			

Source: primary data processed (Appendix 2)

Based on Table 5.1 it can be seen from 308 respondents, the highest value of willingness to pay customer PDAM Tirtamarta to quality improvement is 1 and the lowest value of willingness to pay is 0. From the results also showed that the results of research dominated by respondents who are willing to pay for the quality improvement of IDR6,000.

The lowest value of income variable or (INC) is IDR500,000 while the highest value is IDR7,500,000 with the average value of the variable from the income variable is IDR17,507,467,532. The lowest value of the variable the last level of education or (EDU) taken by the respondents are 6 years or Elementary School, in this research the researcher measure based on the length of formal education pursued stated in the year. While the highest value of the educational variable are 16 years or Bachelor Degree. Based on the data above, the average value of the last educational variables are

12.0812 years it means that from 308 respondents dominated by the last education or from Senior High School.

House ownership variable (OWN) in Table 5.1 shows that the lowest value is 0, while the highest value of this variable is 1. The average value of the variable of house ownership shows that most of the houses owned by the residents are self-owned. Based on the research results can also be seen that the lowest value of the family members (FAM) is 0, while the highest value is 7 people. The average value of the dependent variable is 2.3669. It states that in this research dominated by the respondents who have the family members as much as 2 people.

Water quality variable or (WQ), with the minimum value is 0 and the maximum value is 1. The average value of the WQ or water quality variable is 0.6818 which indicates that the respondent is dominated by respondents who want to pay for quality improvement of PDAM Tirtamarta. The last variable is customer satisfaction (SCUST) of the service with a minimum value of 0 and a maximum value of 1, the result of the average value of the SCUST variable is 0.6526 which means the respondent is dominated by the household customer who wants to pay for the quality improvement of PDAM Tirtamarta.

B. Binary Logistic Regression Results

1. Classification Accuracy Test

In the Table above 5.2 of prediction column, it can be seen that respondents who are willing to pay on the predicted are 307 people, while from the observed respondents are actually willing to pay are 270 respondents. Respondents who are unwilling to pay on the predicted are 1, while from the observed respondents are actually unwilling to pay are 38 respondents. From the results the percentage of model accuracy in order to classificate the observation as overall is as much as 88%.

Table 5.2
Classification Table

Observed			Predicted		
			WTP (Rp 6.000,-)		Percentage Correct
			Not Willing	Willing to Pay	
Step 1	Willing ness to pay	Not Willing	1	37	2,6
		Willing to Pay	0	270	100,0
	Overall Percentage				88,0

Source: primary data processed (Appendix 2)

2. Feasibility Model Test

a. Nagelkerke Model Test

Table 5.3
Nagelkerke R Square Test

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	205,982 ^a	,075	,143

Source: primary data processed (Appendix 2)

From the Table 5.3 above can be seen that the value Nagelkerke R Square is equal to 0,143 or by 14,3%, The results indicate that the independent variable can explain the dependent variable of 0,143 or 14,3%, while the rest of 0,857 or 85.7% described outside the model of this research.

b. Hosmer Lemeshow Test (H-L Test)

Table 5.4
Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	8,454	8	,390

Source: primary data processed (Appendix 2)

From the result of Hosmer and Lemeshow test in Table 5.4 it can be seen that the value of Chi-Square is 8,454 with significance value 0,390 which shows that income variable, education, house ownership, the family members, water quality and customer satisfaction in this research able to predict variable of willingness to pay so that the research model is feasible for use in research.

3. Signification Model Test

a. Partial Test

Table 5.5
Partial Test

		B	Wald	Exp (B)
Step 1 ^a	INC	,000** (,000)	6,920	1,000
	EDU	,200** (,074)	7,355	1,221
	OWN(1)	-,798 (,531)	2,261	,450
	FAM	,121 (,153)	,625	1,129
	WQ(1)	1,069** (,542)	3,893	2,912
	SCUST(1)	,954** (,479)	3,960	2,595
	Constant	-,174 (,883)	,039	,841

Notes: Dependent Variable: dummy WTP; () Shows the coefficient of Standard Error; * Signification in level 1% ($\alpha = 0,01\%$); ** Signification in level 5% ($\alpha = 0,05\%$); *** Signification in level 10% ($\alpha = 0,10\%$)

The results from the above estimation can be written with the following formula:

$$WTP = 6.000 + 0,000 \text{ INC} + 0,200 \text{ EDU} - 0,798 \text{ OWN} + 0,121 \text{ FAM} + 1,069 \text{ WQ} + 0,954 \text{ SCUST} + e$$

From the Table 5.5 using significance level in 1% , 5%, and 10% shows a variable is said to have a significant influence if it has a significance value of $<0,01$, $< 0,05$ and $<0,10$. In the table above are known that the variable income, education, water quality, and customer satisfaction has an influence on the variable willingness to pay which are has an influence on the significance level of $< 5\%$.

1) Income Variable

The significance level of income variable is 0,009 that is smaller than 0,05. It shows that income variable has a positive and significant influence on the willingness to pay variable. The value of odds ratio of income variable is 1,000 which means higher income level influence willingness to pay of respondents one time bigger compared to respondent in lower income. The higher their income will increase the willingness to pay for the quality improvement of the PDAM Tirtamarta.

2) Education Variable

Based on Table 5.5 it can be seen that the level of education variable have a positive and significant relationship at level 5% it means the significance value of the variable is $<0,05$ is 0,007. Regression coefficient on education variable is 0,200 shows there is positive influence between education variable and variable of willingness to pay. The higher education level of respondents, make the willingness to pay for quality improvements is also higher, with an odds ratio of 1,189 indicates that when the higher education is taken will increase the willingness of respondents to pay for quality

improvement of PDAM Tirtamarta one times bigger than respondents with lower levels of education.

3) House Ownership Variable

The significance level in the variable of house ownership in table 5.5 shows that the significance is greater than 0,05 meaning that the variable of house ownership has no influence on willingness to pay variable. Or is not enough evidence that the house ownership variable affects the probability of respondents to pay for quality improvement of PDAM Tirtamarta.

4) The Family Members Variable

In the binary logistic result, the dependent variable has a significance value $>0,05$ which means the independent variable does not affect the willingness to pay variable. So there is insufficient evidence that the dependent variable has an influence on a person's tendency to pay for quality improvement, or there is insufficient evidence that the number of dependents has the influence of a person to pay for the quality improvement of PDAM Tirtamarta.

5) Water Quality Variable

From the Table 5.5 of regression results obtained that the quality of water has a significant and positive impact on willingness to pay. The significant value of water quality variables is 0,048 or significant at 5% level. The odd ratio value in this research was 2,912 which showed that better water quality would affect a person of willingness to pay for water quality improvement 2 times greater than bad water quality. This variable is in a high level of significance so that it can be interpreted that the water quality variables affect the willingness to pay a person for quality improvements from the PDAM Tirtamarta.

6) Customer Satisfaction Variable

The value of customer satisfaction variables has a positive and significant relationship at the 5% level or 0,047. Regression coefficient of customer satisfaction is positive between customer satisfaction variable and willingness to pay variable, it means that there is influence on customer satisfaction variable with willingness to pay variable, increasing customer satisfaction about service from PDAM will make willingness to pay quality improvement also increase, with an odds ratio of 2,595 indicates when higher satisfaction level on service will affect a person to pay for quality improvement of PDAM 2 times greater than someone with low satisfaction level about service of PDAM Tirtamarta.

b. Simultaneously Test

In the overall test is to determine the influence of independent variables simultaneously to the dependent variable. The results of the test overall test are as follows:

Table 5.6

Simultaneously Test

		Chi-square	Df	Sig.
1	Step	24.155	6	.000
	Block	24.155	6	.000
	Model	24.155	6	.000

Source: primary data processed (Appendix 2)

In the Table 5.6 it can be seen that the Chi-Square value was 24,155 with a significance value of $0,000 < 0,10$ (alpha level 10%). In this case, we can conclude that income, education, home ownership, the family members, water quality, and customer

satisfaction simultaneously affect the dependent variable or at least one independent variable affecting the variable bound.

C. Discussion

1. The Effect of Income toward Willingness to pay

From the results of this research indicate that the income variable has a significant influence on the willingness to pay for quality improvement of PDAM Tirtamarta, the value of the variable coefficient of income has a positive sign which means when the income increase then will also increase the willingness to pay for quality improvement. The higher revenue will also increase the customer's willingness to pay for the quality improvement of the PDAM. If the respondent has a high income then will make the respondent to more loyal and willing to pay for quality improvements from PDAM.

2. The Effect of Education toward Willingness to pay

Based on the results of this research, the variables of education have a positive and significant influence on the willingness to pay which means that the higher level of education pursued by the respondents will also increase the willingness to pay for quality improvement. This is because the higher level of education respondents will make respondents increased the willingness to pay because respondent considers quality improvement is important. This is coupled with household customers who have a higher formal education will be more rational in making decisions to consume a commodity.

3. The Effect of House Ownership toward Willingness to pay

From binary logistic regression result indicate that house ownership variable has no influence on the willingness to pay and coefficient value show a negative sign, H_0 is accepted and H_1 is rejected. The ownership of the house has no effect on the willingness to pay and if see the real condition of the field respondents turns ownership of own property/lease indeed is not a major factor in the willingness of citizens to pay for the quality improvement of PDAM

Tirtamarta. According to the results of interviews in this research, the variable house ownership does not affect the willingness to pay because respondents usually have their own homes that use PDAM and used only at certain times.

4. The Effect of The Family Members toward Willingness to pay

Results from the research that the dependent variable does not affect the willingness to pay. Theoretically it can be said that the value of WTP depends on individual perception, not on the market behavior, therefore the absence of influence of variable of dependent amount to willingness to pay in this research indicates that household customer in willingness to pay for quality improvement PDAM does not consider amount of dependent in his family, from here it appears that the customer in providing an economic assessment of the various benefits to be received does not depend on how many members. The family members have insignificantly effect as well also because they have cost factors that have been allocated to the family for other needs so that the family members are not one of the factors of willingness to pay for quality improvement.

5. The Effect of Water Quality toward Willingness to pay

From the results of the research indicate that there is a positive and significant relationship between water quality variables to the willingness to pay which shows when the improvement of water quality will increase the tendency to pay for quality improvement of PDAM Tirtamarta. The smoother and better of water quality from PDAM production will increase the consumer's tendency to pay for water quality improvements. The better quality of water offered by the PDAM will increase the willingness to pay for quality improvement. Here it appears that the willingness to pay for quality improvements related to good or bad water quality.

6. The Effect of Customer Satisfaction toward Willingness to pay

The result of binary logistic regression test shows that there is a positive and significant correlation between customer satisfaction variable to the willingness to pay. This shows that

household customers who have satisfaction with the service of PDAM will be more loyal in their willingness to pay for the quality improvement because by participating in quality improvement that is the turn of leaking pipe into new pipe will increase customer satisfaction on the performance of PDAM. This displays that the more respondents are satisfied with the quality of the existing water source the more they are willing to pay. This will certainly improve customer satisfaction on PDAM performance because of the credibility and quick response to quality improvement that is with the turn of the leaking pipe into a new pipe.

CONCLUSION

1. The willingness to pay value of the household customers to the quality improvement of PDAM Tirtamarta amounted to 0,88. The willingness to pay variable are dummy variable, 0 describes not willing to pay and 1 explains the willingness to pay for quality improvement of PDAM Tirtamarta. From 308 respondents dominated by respondents who are willing to pay for the quality improvement of PDAM Tirtamarta through bill amounting to IDR6,000.-.
2. The income variable significantly affects the willingness to pay of the household customer to the quality improvement of PDAM Tirtamarta, when there is an increase of income on the respondent it will increase the willingness to pay for the quality improvement, assuming other variables are considered fixed.
3. Educational variables has a significant influence on the willingness to pay of household customers to the quality improvement of PDAM Tirtamarta, the higher education level of a person will also increase the willingness to pay of the household customers for the quality improvement of PDAM Tirtamarta. The level of significance of the last educational variable is 0.007.
4. Water Quality variables has influence and significance to the willingness to pay. This indicates that the better the quality of water will increasingly affect the respondents for willingness to pay to improve the quality of the PDAM.

5. Customer Satisfaction variable to the service by the respondent has a significant influence on willingness to pay. The higher the customer satisfaction, the willingness to pay respondents to the quality improvement will also increase.

RECOMMENDATION

1. One of the ways to improve water quality of PDAM Tirtamarta is repairing leaking pipe into new pipe. Improved quality will reduce leakage occurring in the future PDAM Tirtamarta so that can reduce wasted water losses by replacing the leaking pipes with new pipes. To the tariff decision makers for PDAM programs, it is better to include the elements of willingness to pay, so that decision making can be fairer and in accordance with the ability of all parties.
2. Income has a positive and significant relationship in this research when there is increase in the income of respondents then the desire to pay also increased. So it is expected to improve the standard of living of the society because most of the respondents are entrepreneurship, of course, there must be government support to provide training for entrepreneurship, which of course will increase revenue and also the standard of living. So hopefully can increase the willingness to pay for quality improvement from PDAM.
3. Education has a positive influence on willingness to pay for quality improvement from PDAM. The average respondent has education up to senior high school level, so it is necessary to have additional knowledge and information about the quality improvement, this can be done by socializing how important the quality improvement reduce water losses that occur in PDAM.
4. The water quality level has a significant influence on the willingness to pay of the household customer to the quality improvement of PDAM. The better water quality then will increase as well willingness to pay. Good water quality can be seen from the smoothness, cleanliness, quantity, and clarity, considering the water is one of the commodities in use every day. So it is expected that the quality improvement program with the replacement of leaking pipes into new pipes can be a sustainable

program that can improve water quality in the long term, this certainly needs good cooperation between government and PDAM. So the need for good water quality can be realized.

5. The level of customer satisfaction has a significant influence on the willingness to pay of household customers to the quality improvement of PDAM Tirtamarta. Customer satisfaction with PDAM service will increase the willingness to pay. In this case the need for quick response action and review of PDAM Tirtamarta about the service, this service can be in the form of easy access and socialization and information about PDAM quality improvement program that can facilitate the respondent. This situation indicates that PDAM need to expand access to respondents in order to obtain ease of service. With the improvement of the quality of the replacement of a leaking pipe into a new pipe is expected to increase customer satisfaction that has been a customer of PDAM Tirtamarta. Given the rapid response of PDAM to pipeline repairs, it can increase respondents' credibility in other PDAM programs.

RESEARCH LIMITATION

1. In this research the sample studied has a considerable amount of 308 respondents that require a long time and more funds.
2. Not everyone in Yogyakarta City be a customer of PDAM, so it is quite difficult to find respondents. In addition, interview respondents should adjust the respondent's time, generally, respondents cannot be found during working hours. So the researchers find the time when the respondent has finished working or is not working. In this research, the researchers asked each respondent and made sure that they use the PDAM so it takes more time to get data from the respondents.
3. The research location is done in the city and the average working populations are busy so to get the information from the respondents are quite difficult because some of them have other activities and do not want to be interviewed.
4. The independent variable describes the dependent variable only by 14%, while the rest is influenced by the model outside of this research. This is because this research is a research with primary data type.

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