

The Determinant of Willingness to Pay for Waste Management in Slum Area

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Abstract: This study aims to determine the willingness to pay for waste management and to analyze the factors that influence it. This study uses primary data through questionnaires to 120 people as respondents in Seberang Ulu I and Ilir Barat II districts. This study uses the Contingent Valuation Method (CVM) and Multiple Linear Regression Analysis. The results of this study indicate that 110 respondents said that they were willing to pay and 10 respondents said that they were not willing to pay for waste management. The average amount of waste management costs that are willing to be paid is Rp. 5,645.45. Age and income variables have a positive and significant effect while the type of work has a negative and significant effect on the willingness to pay for waste management. The variable of level educations, family members, and characteristics of slums have no significant effect.

1 INTRODUCTION

Cities are urban areas that have administrative status as a city, both small municipalities and metropolitan cities (Sjafrizal, 2012: 198). The city is very important because urban areas have a function in social life which is a place of population settlement and various economic and social activities. In addition, a city is called to develop if the provision of facilities and infrastructures can offset the needs of the population in the city (Samli, 2012: 74). Palembang as the capital city of South Sumatra experienced rapid development. An increase in the number of migrants to the city of Palembang caused an increase in the need for housing.

The need for housing should be in accordance with population growth. However, efforts to fulfill housing needs are partly hampered by the low economic capacity of some communities and the high cost of housing. For low-income earners, it is a big problem, this is caused by their low economic and educational capacity, so it is not possible to fulfill a decent place to live (Pinem, 2010: 71).

The problems cause people to choose to live in residential houses with minimum facilities and cause the emergence of slums themselves. In general, the emergence of slum areas can be seen from the pattern

of housing and settlements in the city of Palembang. (Preparation or Database Updating of Housing and Slum Area Conditions in Palembang City, 2009: 3).

The creation of slums is a negative impact of a concept of development. This condition is further aggravated by the decline in environmental quality due to inadequate availability of city infrastructure (Preparation or Database Database of Housing and Slum Area Conditions in Palembang City, 2009: 2). In addition, an increase in the population also causes an increase in consumption of goods and services that cause community life problems, one of which is the problem of waste (Ruban, Angela et.al, 2014: 103).

The most dominant problem in the slums area in Palembang City is garbage that is dumped carelessly by the surrounding community so that it accumulates around the settlements. The landfill can have negative impacts on the environment and society such as the source of the disease, blockage due to waste disposal in the river or ditch, pollution and damage to the beautiful environment, reduced quality of clean water, odor around the environment, disturbing the comfort of the community.

In some sub-districts of Palembang City, waste management is carried out by janitors who collect

garbage that has been placed in the garbage can in front of the house. However, it will be very different if the area does not have access to waste management. One of the slums with related problems in the lack of waste management is in Seberang Ulu I and Ilir Barat II Subdistricts.

The conditions of Slum Areas in Seberang Ulu I (SU I) and Ilir Barat II (IB II) Subdistricts are already very crowded with predominantly stilted houses and most of the buildings are still made of wood. Clean water supply is also inadequate so people still rely on refill water or river water to fulfill their lives. In the waste treatment system, this area has not been managed by the relevant government or agencies due to the limited access and equipment. Sanitation is still so bad that local people still throw garbage directly into the river or on their home page. This factor causes the level of slums in Seberang Ulu I and Ilir Barat II to be very high (Preparation or Database of Housing and Slum Area Conditions in Palembang City, 2014: 30).

If waste management in slum areas has not been overcome then it will be a worse problem for the community and the environment. In addition, the burden of government costs in managing waste will be even higher. To overcome these problems, the need to apply environmental insights about waste management for example by forming community self-help in waste management such as forming a waste bank so that people can manage the waste into economic value.

In creating self-help groups, the community does not need a small fee so that it requires collaboration between the government and the community. This collaboration can begin with the willingness of the community to set aside a little income to help the government in waste management. If people want to return to a clean environment, then the community will be willing to spend some money to pay for it. This is the basis of research by looking for willingness to pay the community in improving the surrounding environment. Many factors can influence the willingness to pay for waste management, namely age, level of education, family members, income, employment and characteristics of slums. According to Suryani (2016), age influences the willingness to pay individuals because of increasing age, the mindset of public awareness will increase. In addition, it is also supported by research conducted by Vitor (2013) that the fact is that if they get older, they will increasingly understand the importance of maintaining a clean environment. In addition, they know that paying for waste management will improve the quality of the environment. Afifah, et, al (2013)

stated that high education affects someone to pay a large amount. This was also supported by Ifabiyi in Ladiyance and Yuliana (2014) that higher education had a higher willingness to pay. In Brazil and India, it is reported that households with higher education tend to be willing to pay more. This variable is considered influential because generally, people with better levels of education tend to better understand the importance of protecting the environment.

The family members is also considered to affect the willingness to pay. According to Prasetyo and Saptutyiningsih (2013), the number of family dependents is related to the amount of expenditure that will be incurred by the family. Widiastuti (2014) explained that if a family with more members would spend money on their daily needs, the allocation of funds for the environment would be reduced. But if the family is covered a little, it will give a greater value. Income is one factor that influences the willingness to pay. If a high determined price with their income will slightly affect the value of the payment. In a study conducted by Saptutyiningsih (2007) that the income received affects the willingness to pay for the community because the higher the income, the higher the value issued to improve the quality of the environment. Conversely, if the income obtained is low then the value issued will also be low.

In addition to income, the type of work done by the community is also a factor. Formal and permanent work with the high economic capacity gained, the greater a person's ability to maintain and improve the quality of the environment. Conversely, if you have an informal job with the income that is not fixed, a person's willingness to improve the environment is low due to the many expenses they must prioritize first. Widiastuti (2014) explains that people who have formal jobs such as private or public employees have a definite income every month so they tend to pay a high value. As for informal, the income is uncertain so it provides a lower value. Furthermore, the influencing factors are the characteristics of slums. Generally, for people who live in heavy slums, they will be willing to pay more because they are disturbed due to an unclean environment. In accordance with research by Widiastuti (2014) who argued that people who feel disturbed by the presence of waste will pay more than the people who do not feel disturbed by the presence of garbage around the home garden.

2 LITERATURE REVIEW

Economic valuation is one of the ways used to provide a quantitative value for goods and services produced by natural and environmental resources on market values and non-market values (Igunawati, 2010: 30). According to Fauzi (2004: 212), resource valuation techniques that cannot be marketed (non-market valuation) can be classified into two groups. The first group is a group consisting of revealed desire techniques or revealed WTPs. Some of the techniques included in this group are the travel cost method, hedonic pricing, and random utility models. Whereas the second group is valuation techniques based on surveys where the willingness to pay or willingness to pay is obtained directly by asking individuals or the community about their desire to pay for goods and services produced by natural resources. The technique often used is the Contingent Valuation Method (CVM).

Formally, the willingness to pay or willingness to pay (WTP) is someone against goods and services produced by natural resources and the environment (Fauzi, 2004: 209). In the WTP, it is calculated how far the ability of each individual or community to pay or spend money to improve the quality of the environment or its surroundings to suit the desired conditions. Rahmawati (2014: 42) explains that individual preferences for the value of damage, environment, discomfort, and increase or decrease in the level of welfare of the users and management of resources differ from one another. Therefore, various PAPs arise for each person in relation to their views on the WTP value.

The economic value of resources and the environment can be obtained directly by asking individuals or the community about the willingness to pay for goods and services produced by natural resources through the Contingent Valuation Method (CVM). CVM aims to find out the willingness to pay from the community, for example, to improve environmental quality (water, air, etc.). Hanley and Spash in Sontikasyah (2010: 35), stated that CVM is a way of directly calculating the willingness to pay to the public by the point of preference of individuals assessing objects whose emphasis is on the standard value of money. This method allows all commodities not traded in the market to be estimated for economic value. Thus, the economic value of a public object can be measured by the concept of WTP.

According to Fauzi (2004:220), in the operational phase, the application of the CVM approach consists of five stages: 1) Making a market hypothesis, 2) Obtaining

auction value 3) Calculating the average WTP, 4) Estimating the Auction Curve, 5) Aggregating data.

3 RESEARCH METHODS

This study discusses about the value of community willingness to pay in waste management in Slum Areas in Seberang Ulu I and Ilir Barat II as well as analyzing the age factor, recent education, employment, income, number of family members covered and characteristics of slums affecting willingness to pay communities in waste management in slums areas Seberang Ulu I and Ilir Barat II. The dependent variable in this study is the willingness to pay and the independent variables in this study are age, education, income, occupation, family members and characteristics of slums.

The population of this study was residents who lived in slums in the city of Palembang using cluster sampling technique, so the most slum areas were chosen, namely in Seberang Ulu I and Ilir Barat II. Furthermore, from the two sub-districts will be in the village based on the level of slums with the priority scale of treatment that has been determined, namely 15 Ulu, 3-4 Ulu, 5 Ulu, 30 Ilir, 29 Ilir and 28 Ilir Subdistricts. each RT in the village needs to estimate the proportion of the sample that can be calculated by the formula (Supranto, 2008: 55):

$$n = \frac{1}{4} \left[\frac{Z_{\alpha/2}}{E} \right]^2$$

Based on the calculation of the formula, the sampling used in this study is 100 respondents but so that the data is not biased it will take 120 respondents. Population research samples can be seen in Table 1 which shows the number of respondents to be taken in each village.

Table 1: Sample of Research in Seberang Ulu I District and Ilir Barat II

District	Area	Number of Location	Number of Respondents
5 Ulu	RT 4,5,6,7,8,9,10,11,12,13,14,15,20, 21,33,34,54,55,56,57, 58	21	35
3-4 Ulu	RT 2,3,4,5,12,19,24,52	8	17
15 Ulu	RT 21,2	2	8
30 Ilir	RT 1,2,3,4,5,6,7,8,8A,9,9A,10,11,12,13,14,15,16,17,18,19,20,20A,22, 22A	26	39
29 Ilir	RT 1,2,5,13,21,33,35	7	11
28 Ilir	RT 4,6,13	3	10
Total			120

The method used in this study is the Contingent Valuation Method (CVM). To calculate the WTP, the total willingness to pay (TWP) formula is used as follows: (Kadir in Handayani, 2015: 7)

$$TWTP = \sum WTP_i (n_i/N)P$$

Multiple linear analysis methods are used to measure the impact of age, level of education, the number of family members covered, work and income characteristics of slums that affect the willingness to pay for waste management in slums in Ulu I and Ilir Barat II Districts. Based on these equations, the models in this study are as follows:

$$WTP = \beta + \beta_1 US_1 + \beta_2 PT + \beta_3 JT_3 + \beta_4 PEN_4 + \beta_5 DPEK_5 + \beta_6 DKPK_6 + e.$$

The model used to calculate dummy variables is (Nachrowi and Usman, 2007):

$$Y = \alpha + \beta D + u$$

From this model, it can be seen that:

$$E(Y_i | D_i = 1) = \alpha + \beta$$

$$E(Y_i | D_i = 0) = \alpha$$

3.1 Definition of Operational Variables

Table 2: Definition of Operational Variables

Variables	Definition	Unit
Willingness to Pay	Willingness to pay paid by the community	Rupiah
Age	Age of worker	Year
Level of education	The number of years of education has been reached.	Year
Income	The amount of total expenditure spent	Rupiah
Type of Work	Work in daily life	1 = Informal 0 = Formal
Total liabilities	The number of people who are dependent on the head of the family	Person
Characteristics of Slum Area	based on the surrounding environment	1 = Slum Light 2 = Moderate Slum 3 = Heavy slums

4 RESULTS AND DISCUSSION.

4.1 Age Cross Tabulation on WTP

Age is a factor that can affect WTP. Age shows a person's maturity, the older a person means to have a wider awareness of a better environment.

Table 3: Cross Tabulations of Age and WTP

Willingness to pay (Rp)	Age (Year)			Total
	20-40	41-60	61-90	
0	9	1	0	10
3000-5000	52	32	8	92
6000-10000	6	8	0	14
11000-12500	0	4	0	4
Total	18	45	8	120

Source: Primary Data, 2018

Table 3 shows that the 3000-5000 WTP score was chosen by respondents aged 20-40 years, compared to respondents who were more than 40 years of age. This is because the majority of people under the age of 40 have the desire to pay but there is still much they have to spend on household matters

4.2 Cross Tabulations of Level Educations and WTP

The level of education is closely related to one's knowledge of the surrounding environment. The factor of education is important because it influences the mindset of a person to take action to maintain the quality of the environment and has the desire to make goods an economic value.

Table 4: Cross Tabulations of level educations and WTP

Willingness to pay (Rp)	Level of educations (year)			Total
	0-6	7-12	13-20	
0	3	6	1	10
3000-5000	47	44	1	92
6000-10000	4	5	5	14
11000-12500	1	0	3	44
Total	18	45	8	120

Source: Primary data, 2018

Table 4 shows that respondents with education range 0-6 years have the desire to pay for waste management even though the smallest WTP value is from the range of WTP value of Rp. 3,000 - Rp. 5,000. This is also supported by the results of their interviews that they are willing to pay if the price is not too expensive. In addition, although many elementary school graduates, respondents know about the benefits of waste management and they agree if waste management activities are carried out

4.3 Cross Tabulations between Type of Work and WTP

The job also influences the willingness to pay. If you have an informal job, someone's willingness to improve the environment will be low, and vice versa. Table 5 shows the relationship between types of work and WTP. Based on the table, many respondents who work informally choose a value of IDR 3,000-IDR 5,000. This means that informal work affects the value of the WTP they choose. Whereas for respondents who choose not to pay because their non-permanent work affects income so that they are not necessarily able to pay the fee every month.

Table 5: Cross Tabulations between the level of education and WTP

Willingness to Pay (Rp)	Type of Work		Total
	Informal	Formal	
0	10	0	10
3000-5000	90	2	102
6000-10000	8	6	14
11000-12500	1	3	4
Total	109	11	120

Source: Primary data 2018

4.4 Cross-tabulation Income and WTP

Income also affects WTP, if the respondent has a small income, it will influence the willingness to pay because of the amount of expenditure they prioritize first.

Table 6: Cross Tabulation between income and WTP

Willingness to pay (Rp)	Income (000/Rp)			Total
	500-1000	1010-2000	>2000	
0	80	21	0	10
3000-5000	72	19	1	92
6000-10000	10	4	0	14
11000-12500	04	0	3	4
Total	18	45	8	120

Source: Primary data, 2018

Table 6 shows the relationship between WTP and income. With their small income, they have to adjust their daily expenses and try to minimize finance for the more important circumstances. There are even respondents who choose not to shop and only eat if they have no money. This situation made many respondents choose to pay the WTP at a price of Rp. 3000 and Rp. 5,000 because they felt that the price had not been too burdensome to the respondents. Whereas, around 10 respondents were not willing to pay on the grounds of little expenditure and income, as well as other dependents they had to pay so they chose not to spend money at all.

4.5 Cross Tabulations between Numbers of Dependents and Reservations Wage

The family members show how many people are covered by the head of the family. If the respondent has large family members does not rule out the possibility that it will affect the amount of willingness to pay.

Table 7: Cross Tabulations the numbers of dependents and WTP

Willingness to pay (Rp)	The numbers of dependents (person)			Total
	0-3	4-6	7-10	
0	10	0	0	10
3000-5000	72	19	1	92
6000-10000	10	4	0	14
11000-12500	4	0	0	4
Total	96	23	1	120

Source: Primary Data 2018

Based on Table 7, people who choose the value of the 3000-5000 WTP have dependents ranging from 0-3 people. Respondents who chose the value of WTP were small even though there were fewer than three dependents because they saw their income and expenses first. Many of these respondents have children who are still in school who do not need a lot of money so they prefer to choose the value of PAPs under 10,000. Meanwhile, respondents who did not want to pay for waste management due to the number of dependents so they were afraid that they would not be able to pay for the waste management so they thought it would be better to free it.

4.6 Cross Tabulation between Slum Area Characteristics and WTP

If the respondent resides in a slum with a heavier level of slum, it should make the respondent aware of paying to improve his environment

Table 8: Cross Tabulation between Slum Area Characteristics and WTP

Willingness to pay (Rp)	Slum Area Characteristics			Total
	Ringan	Sedang	Berat	
0	0	0	10	10
3000-5000	8	21	63	92
6000-10000	0	5	9	14
11000-12500	0	1	3	4
Total	8	45	85	120

Source: Primary Data, 2018

Based on Table 8, people who live in low slums to heavy slums choose more with 3000-5000 WTP values. So this shows no difference regarding the value of willingness to pay them for waste management. This is based on the reason for their uncertain income, so choosing a small WTP value of Rp. 3,000 and Rp. 5,000. Even so, there are some people who live both in medium slums and heavy slums choose WTPs above IDR 5,000 with a WTP value of IDR 12,500 with the reason that they are still

able to pay if the payment can reduce the existing waste.

4.7 Willingness To Pay Analysis

The Contingent Valuation Method (CVM) approach in this study was used to analyze the WTP values of communities in Slum Areas in Seberang Ulu I and Ilir II Districts for environmental conservation. In this study, the bid value used to determine the respondent's WTP value was obtained through the dichotomous choice method by showing a certain amount of money which was then asked whether the respondent was willing to pay or not with this amount of money in an effort to preserve the environment.

Table 9: WTP value based on Respondent Number in Seberang Ulu I Subdistrict and Ilir Barat II

		Willingness to pay (Rp/000)					Total
		3	5	7.5	10	12.5	
The number of respondents	SU I	6	40	2	4	4	56
	IB II	6	40	0	8	0	54
Total							110

Source: Primary data, 2018

WTP values that are willing to be paid by the community in Seberang Ulu I and Ilir Barat II Subdistricts can be seen in Table 2, which shows that in the Seberang Ulu I and Ilir Barat II Sub-Districts, the most option Rp. 5,000.

To find out how much willingness to pay respondents can be seen in Table 10. The average WTP of respondents is Rp. 5,645.45. The average value of the respondent's WTP can be used as a reference in pricing which can then be used as funds to carry out waste management efforts in slums in Seberang Ulu I and Ilir Barat II Subdistricts.

Table 10: Distribution WTP Value of Respondents in Slum Areas in Seberang Ulu I and Ilir Barat II Subdistricts

Willingness to pay (Rp)	Frequency (The Number of respondents)	Relative Frequency (P _f)	Average Score WTP (Rp/Bln)
3000	12	0.109	327.27
5000	80	0.727	3636.36
7500	2	0.018	136.36
10000	12	0.109	1090.91
12500	4	0.036	454.55
110		8	5.645.45

Based on the respondents' WTP value on the number of respondents who chose the WTP value, obtained the WTP curve of each respondent. The

results of a survey conducted on the people living in the Seberang Ulu I and Ilir West II slums for the WTP values that were willing to be issued can be seen in Figure 1. Respondents' WTPs differed according to the respondents' abilities.

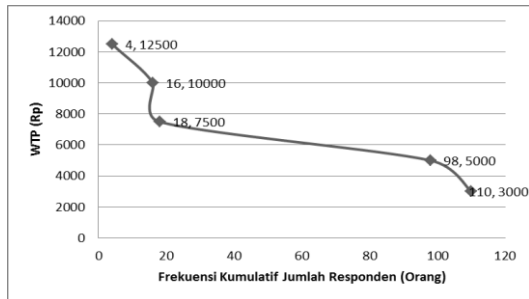


Figure 1: Alleged Respondent's WTP Curve

Source: Primary Data, processed (2018)

Table 11: Total of WTP Respondent Slum Area Community in Seberang Ulu I and Ilir Barat II

Willingness to pay (Rp)	Frequency (The Number of respondents)	The number of Location	Total (Rp)
3000	12	7	21.000
5000	80	49	245.000
7500	2	2	15.000
10000	12	7	70.000
12500	4	2	25.000
Total	110	8	376.000

Sumber: Primary Data, processed (2018)

The total WTP value (TWTP) of respondents was calculated based on the distribution data of the respondents' WTP. The results of TWTP calculation can be seen in Table 11. Table 11 Total WTP of Respondents in Slums in Seberang Ulu I and Ilir Barat II District. Based on the results of the calculation, the WTP value of community respondents in slums in Seberang Ulu I and Ilir Barat II districts is Rp. 376,000.00.

4.8 Multiple Linear Regression Analysis

The age level variable (US) has a sig value of 0.024, which means that age is significant and has a significant effect on the probability of the respondents paying in the waste management efforts in the Seberang Ulu I and Ilir West II slums at a significant level of 5%. So, the older the respondent's age level,

the better awareness of the surrounding environment and the tendency to be willing to pay.

Table 12: Multiple Regression Output

Variable	B	T	sig
Age (US)	42.596	2.287	0.024
Education (PT)	41.722	72.938	0.568
Member of Dependents Family (JT)	-164.912	-0.896	0.372
Income (PEN)	0.001	2.397	0.018
Job Dummy (DJPEK)			
*DJPEK1	-2569.501	-2.513	0.013
Characteristics of Slums Dummy (DKPK)			
*DKPK2	860.517	0.977	0.331
*DKPK3	-558.687	-809.042	0.691

Source: Primary Data, 2018

The coefficient of age variables has a positive influence, meaning that the more the age, the greater the value of the WTP paid for improving waste management in the Seberang Ulu I and Ilir West II slums because age will make a person become more mature in making judgments. If the age increases by 1 year, then the willingness to pay will increase by 42,596. The results of this study are in accordance with that conducted by Prasetyo and Saptutyningsih (2013) that age has a significant effect on the willingness to pay individuals because of the increasing age, the mindset in caring for the importance of protecting and protecting the surrounding environment and community environment increases.

The level of education variable (PT) has a sig value of 0.568 which indicates that this variable is not significant to the probability of the respondent paying waste management in the slums in Seberang Ulu I and Ilir Barat II settlements. This means that not all highly educated people are willing to pay. Although there are some people with high education who have an awareness of the importance of the environment so that they pay a high amount too. This is consistent with research conducted by Annisa, et.al (2015) that the level of education is not a determinant of community willingness because not all highly educated people are willing to pay even a large amount, because there are some societies with low education willing to pay, because they have awareness of the surrounding environment.

The family members (JT) does not have a significant effect on the willingness to pay for waste management in slums in Seberang Ulu I and Ilir Barat II sub-districts because the probability value of JT is 0.372. This means that even though many or no

family members are borne by the head of the family still have the desire to pay because the family has an environmental awareness because after all the dirty environment affects their health. The results of this study are in accordance with the research of Annisa, et.al (2015), Afifah, et, al (2013), Amanda (2009) that the family members do not affect the willingness to pay the community.

The income variable (PEN) has a significance value of 0.018 which indicates that income has a significant effect on the willingness to pay for waste management in slums in Seberang Ulu I and Ilir Barat II settlements. The income variable coefficient is positive, so income has a positive influence. If the income increases by 1 rupiah, it will increase by 0.001. If the income of individuals living in slums in Seberang Ulu I and Ilir Barat II sub-districts increases, the willingness to pay the public will also be higher with a high WTP value as well.

However, with income conditions that are still practically low, it is not wrong if the WTP level of the people living in slums in the Seberang Ulu I and Ilir II sub-districts is small. This is in accordance with the law of demand theory and one of the factors that influence it is the income of the community which states that the high and low income affects the number of their requests. If the price incurred to improve the environment is high and on the other hand the income they receive is small, it will affect their expenses so they will choose a lower price. The results of this study are in accordance with Amanda (2009) which shows that the higher one's income, the higher the desire to improve the environment, and vice versa. If the income received is low, then the value of their willingness to pay will be low.

Work type variables are dummy variables with 1 = informal and 0 = formal. This variable has a sig value of 0.013 which indicates that this type of work has a significant influence on the willingness to pay the community, which means that statistically there are significant differences between types of formal employment compared to informal types of work

Variables in the type of informal coefficient work are smaller at 2565,496 so that informal work gives a value of WTP contribution of 2565,496 less than formal employment. The results also show that formal work will make a large contribution to payments for waste management compared to people who have informal jobs.

The results of this study are consistent with the research conducted by Widiastuti (2014) that formal employment such as private or public employees have a definite income every month so they tend to pay

high-value WTPs. As for informal, the income is uncertain so it provides a lower WTP value.

Variable characteristics of slums (KPK) are dummy values with 1 = low slums, 2 = moderate slums and 3 = heavy slums. The DKPK2 and DKPK3 variables have a sig value of 0.331 and 0.491 which indicates that the characteristics of slum areas do not have a significant influence on the willingness to pay the community, which means that there is no statistically significant difference between the characteristics of low, medium and heavy slums towards the WTP value. This is consistent with the results of the interview that the community, whether from low, medium or high Slum Areas, chose almost the same WTP value.

5 CONCLUSIONS

Factors that influence people's willingness to pay are age and income variables which have a positive and significant effect while the type of work has a negative and significant effect on the willingness to pay for waste management. The level of education variable, family members, and the characteristics of slums have no significant effect. As many as 110 respondents stated their willingness to pay in waste management in Slum Areas in Seberang Ulu I and Ilir Barat II sub-districts with an average willingness to pay the community per month was Rp. 6 645.45 and a total of Rp. 376,000.0.

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