

# Capability and Development of Paying Waste Management towards Rumid Environmental Improvement in Palembang City Growth Center

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**Capability and Development of Paying Waste Management  
towards Rumid Environmental Improvement in Palembang  
City Growth Center**

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**Abstract:** This research was carried out in the slum area located in the sub-district as the growth center of Palembang City, namely Ilir Timur II Subdistrict and secondary growth center, Ilir Barat District II. The analytical method used is the analysis of the Contingent Valuation Method (CVM), and the data used are primary data and secondary data. Public perceptions of participatory waste management efforts to improve environmental quality in slums are relatively good. It can be seen that as much as 61 percent of respondents answered that the people responsible for waste management were the people themselves. The level of public acceptance of participatory waste management efforts to improve the quality of the environment in slums is quite good. 120 people or 80 percent of respondents are willing to pay for waste management. Of the 120 respondents, the amount of rupiah willing to be paid to manage waste is Rp. 1,358,000. With monthly waste management fees of IDR 5,000-10,000, - Factors that influence the amount of willingness to pay for waste management, namely waste volume has a positive and significant effect, while income, education level, and number of dependents have no significant effect. Likewise with gender, between men and women does not have a significant effect so there is no difference in influence. The types of jobs between formal and informal, locations according to the primary, secondary and tertiary growth center categories and slum characteristics also have different effects on willingness to pay for waste management.

**Keywords:** Willingness to Pay; WTP; Environment; Growth Center

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## **Introduction**

The development of the city of Palembang is currently experiencing rapid development especially with the international event of the 2018 Asian Games. In the city of Palembang there are currently a large number of Asian Games supporting infrastructure development

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activities such as the Musi IV and VI Bridges, Construction of Light Rail Transits (LRT), and Fly Bridges Over Airport and Hospitality. Various infrastructure developments can encourage the growth of the growth center. Imelda et al. (2013) concluded that the primary growth center in the city of Palembang was Ilir Timur I and II. The secondary growth centers are Ilir Barat District 1 and II (West of Palembang), Sukarami (North of Palembang), Kalidoni (East), and Seberang Ulu 2 (South of Palembang) and Sako (East of Palembang) while the other districts are hinterland or the tertiary growth center of the city of Palembang.

An area becomes a center of growth because if a location has many facilities and facilities that become the center of attraction (pole of attraction) causes various types of businesses interested in being located in that location and the community comes to use existing facilities (Tarigan, 2009). These facilities are a means to meet the needs of the population. The more complete provision of facilities in a place means the stronger the attractiveness of inviting residents and productive activities to come to the place. This led to urbanization from the regions, especially around Palembang, as a result of the increasing population of Palembang City.

The total population of Palembang City in 2015 was 1,580,517 people, increasing to 1,602,071 in 2016 or 1.35 percent. This population growth is higher than Indonesia's population growth which is equal to 1.27 percent. With the total area of Palembang City, which is 369.2 km<sup>2</sup>, the population density of Palembang City is 3,999 inhabitants per km<sup>2</sup> (BPS, Palembang City, 2017). The rate of population growth that continues to grow every year, accompanied by the ongoing process of urbanization, has an impact on the increasing need for housing or housing. However, meeting the needs of homes for low-income people is a big problem. Because of low income and high housing costs, it is quite difficult to meet decent housing needs (Pinem, 2010). This problem causes low-income people to choose to live in homes with makeshift facilities and cause slums to arise. Low-income communities (MBR) in urban areas occupy land illegally along railway lines, graves, high cliffs, riverbanks and other abandoned lands, this action results in the emergence of squatter (Suminah, 2017).

In the area of Palembang City, based on the Palembang Mayor's Decree No. 488 of 2014 concerning the Determination of the Location of the Slum Settlement Area of Palembang City, there are 59 slum locations. Ilir Timur I and II sub-districts which are growth centers each have 4 and 8 slum locations. In the secondary growth centers, namely Ilir Barat District 1 and II (West of Palembang), there are 1 and 6 slum locations respectively, while Sukarami (North of Palembang) has 1 location, Kalidoni (East side), there is 1 location, and across Ulu 2 (South of Palembang) there are 6 locations and only Sako District (East of Palembang) where there are no slum locations. For the hinterland of Palembang City, the slum area is mostly found in Seberang Ulu 1 District, which is 10 locations.

Apart from the emergence of slum problems, increasing population can increase the volume of waste produced. Garbage is a consequence of complex human activities. The volume of waste produced is proportional to the level of consumption of goods and materials used by humans every day (Annisa, 2015). Every resident, from babies to parents, produces residual waste from the process of his life activities, both eating, cooking, bathing, working and so on. In addition, community consumption patterns and technological advancements contribute to increasingly diverse waste, including packaging

waste that is dangerous and difficult to decompose by nature (Rahman, 2013). Head of the Environment and Hygiene Office of Palembang City, Faizal AR said from Monday to Friday, the volume of waste in Palembang only reached 800 tons to 900 tons per day. However, if you enter Saturday, Sunday and holidays, the amount of waste can grow up to 1,000 tons per day. Furthermore, he said that the Final Disposal Site (TPA) in Palembang which is currently still functioning only in the Sukawinatan area, Sukajaya Village, Palembang (News, 2018). The problem of garbage and slums is a challenge for the Government of Palembang City, considering that in 2017 the City of Palembang managed to maintain the Adipura Cup for the eleventh time. In fact, for 2017, Palembang won the Adipura in the Metropolitan City category, ranking first among cities in Sumatra.

## **Literature Review**

### ***Preference Theory***

The choice theory (theory of choice) explains the reciprocal relationship between preferences (choices) and various obstacles that cause a person to determine his choices. Preferences include choices from simple to complex, to show how one can feel or enjoy everything that is done. But every person is not free to do everything they want and they are constrained by time, income, and many other factors in making their choices. There are 2 conditions for consumers to reach consumer balance (consumer equilibrium), namely: (1) can buy with the resources they have (income), and (2) satisfaction achieved as high as possible (Nicholson, 2002).

### ***Demand Theory***

According to Sukirno (2010) demand is the desire of consumers to buy an item at various price levels for a certain period of time. Demand is influenced by Revenue (Y), Price of other goods (Py), Tastes (T), and other factors (U). The function of a consumer's demand for an item (Dx) is formulated as:  $Dx = f(Y, Py, T, u)$

The consumer surplus arises because the consumer receives more than paid and this is based on the law of marginal utility which is decreasing. The consumer surplus reflects the benefits obtained because it can buy all units of goods at the same low price level.

### ***Value of Natural Resource Economics and Environment***

The approach or method used in this study is the Contingent Valuation Method (CVM), where CVM essentially aims to determine the willingness to pay from the public regarding environmental services resulting from waste management. The stages in this CVM method are as follows: forming a hypothetical market, obtaining an offer value, calculating the estimated WTP (expected WTP, EWTP), determining the aggregate WTP or total WTP (TWTP), estimating the supply curve, and evaluating the implementation of CVM.

### ***Waste and Waste Management***

Palembang City Regulation No. 3 In 2015, Article 35 regulates the management of household waste and similar household waste must be carried out in the scale of RT / RW and / or outgoing / sub-district with technical and service instructions. The amount of garbage collection is regulated by the Regional Regulation of Palembang City No. 27 of 2011 concerning the processing and retribution of waste / cleaning services and provision / removal of latrines.

### **Slums**

Slums are uninhabitable settlements because of irregularities in buildings, high levels of building density, and the quality of buildings and facilities and infrastructure that do not meet the requirements (Law No. 1 of 2011). Palembang City Public Works Public Works Department (2009).

### **Previous research**

Researches that use the Willingness to Pay (WTP) approach in waste management include Emalia and Hundari (2016), Annisa (2015), Ruban (2014), Rahman (2013). Emalia and Hundari (2016) show that the factors that influence the willingness to pay the community are education, income, number of family members, weight of garbage and the number of frequency of transportation. Annisa (2015) obtained the results of the study with a coefficient of determination (R<sup>2</sup>) of 0.561. This shows that income, education, and the number of family members jointly influence household waste PAPs in the Housing Ministry of Simpang Baru Panam Village at 56.1% while 44.9% are influenced by other factors not analyzed. Partially (t test) shows that the income variable has a significant influence on household waste PAPs in the Housing Ministry of Simpang Baru Panam Village. While the education variables and the number of family members do not have a significant influence on household waste PAPs in the Housing Ministry of Simpang Baru Panam Village. The income elasticity coefficient value <1 is also called inelastic, which means that if the income experiences a change of 1%, the resulting WTP variable will change by 0.78%.

Ruban (2014) uses logit regression data analysis and contingent valuation method (CVM). This analysis aims to determine the response of the public willing or not (yes or no) to pay higher retribution fees in order to increase waste management based on four scenarios of waste management offered, namely sanitary landfills, composting, incineration and biogas. Factors that are thought to influence the opportunity of the community are willing or not (yes or no) to pay higher retribution fees, namely the level of education (year), employment, income level (rupiah / month), number of dependents (people), length of stay ( year), distance of house from TPA (m).

Based on the WTP value of each scenario, it is known that the biogas scenario is a scenario with the highest WTP value in Baguala District while in Nusaniwe District is composting. In other words, the two scenarios are the most desirable scenarios for the community in the two sub-districts to be applied at the Toisapu Hamlet landfill.

### **Thinking Framework**

This study examines community perceptions of urban waste management, especially household waste in a participatory manner and analyzes the factors that influence people's willingness and ability to pay for waste management in slums to improve the quality of their environment. These factors are gender, age, education level, number of family members covered, income, type of work, garbage volume and slum settlement characteristics according to the type of growth center.

## Methods

The research was carried out at the slum area located in the sub-district as the center of the growth of the city of Palembang, namely Ilir Timur II District and the secondary growth center, Ilir Barat II District. For the hinterland area, the tertiary growth area of the city of Palembang is the Sebang Ulu II District. The subject matter includes perceptions and willingness and ability to pay for waste management. Besides that, the factors that influence the willingness and ability to pay for waste management were also analyzed, namely gender, age, education level, number of dependents, income, type of work, gender, volume of waste and characteristics of slums based on the growth center category. The approach used to assess community perceptions is qualitative in order to describe community perceptions of the condition of slums and waste management around their homes.

The analytical method used is the analysis of the Contingent Valuation Method (CVM) to find the amount of rupiah that is willing to be paid by the community (Willingness to Pay, abbreviated as WTP). Contingent valuation method (CVM) is a survey method to state the value or price of a population for a commodity that does not have a market such as environmental goods. The purpose of CVM is to know the desire to pay from the community, and to know the desire to accept damage to an environment (Fauzi, 2010).

The data used are primary data and secondary data. Primary data is obtained by field observation methods in the community and slum areas that are the object of research and interviews using questionnaires that contain questions and in-depth interviews related to the problems under study. Secondary data was obtained from various stakeholders including the Regional Development Planning, Research and Development Agency of Palembang City, Office of Public Works and Spatial Planning of the City of Palembang, Office of Environment and Hygiene and Office of Public Housing and Settlement of Palembang Public Works and Housing Public Works Office, and the Central Statistics Agency of Palembang City. In addition, it is also through literature studies from several literature both from textbooks, journals, and scientific works related to this research. Sampling of respondents using cluster sampling technique.

The analysis technique used is the Contingent Valuation Method (CVM) to look for Willingness to Pay which is a direct survey of consumers' willingness to pay. According to Fauzi (2010) several steps must be done in the CVM method:

1. Making Hypothetical Markets. In this study, it will first make a hypothetical market for the resources to be evaluated.
2. Obtain WTP value. The purpose of this survey is to obtain the maximum value of willingness to pay (WTP) from the community towards an effort to improve the quality of their environment. To get the WTP value, the method used is the dichotomous choice method, which is to offer the respondent a willingness to pay or not with this amount of money in an effort to manage waste.
3. Estimating the average value of WTP. WTP<sub>i</sub> can be estimated by using the average value of the total value of the PAP divided by the number of respondents. Alleged average WTP can be calculated by the formula:

$$EWTP = \frac{\sum_{i=1}^n w_i}{n}$$

- EWTP = Alleged average WTP
- Wi = i. WTP value
- n = Number of respondents
- i = 1st respondent who is willing pay (i = 1,2, ..., n)

4. Estimating the WTP Curve. The WTP curve is obtained by expressing WTP as a dependent variable with several unbound variables.
5. Add Data. To calculate WTP, the formula for total willingness to pay (TWP) is used as follows: (Handayani: 2015)

- TWTP =  $\sum_{i=1}^n WTP_i$
- TWTP = Total WTP
- WTPi = sample individual WTP i
- ni = Amount of sample I willing to pay as much as WTP
- N = Number of Samples
- P = Total Population
- i = 1st respondent who is willing pay payment

In this study regression analysis was used to find out the offerings to respondents who were willing to pay with a sum of money (Willingness to pay) in an effort to manage waste (Waste Management) as a dependent variable. Independent variables are factors that influence the amount of money in waste management, namely gender, age, education level, number of dependents, income, type of work, household waste volume and characteristics of slums based on regional growth rates that affect willingness to pay in management garbage. The regression model is as follows:

$$WTP_i = \beta_0 + \beta_1 DSex + \beta_2 Edu + \beta_3 Fam + \beta_4 Y + \beta_5 DWork + \beta_6 Vol + \beta_7 DLoc + \beta_8 DChar + e$$

- WTP = some money that is willing paid for management
- garbage = Willingness to pay
- = Constants
- 1, ..., 9 = Regression coefficient
- Age = Age (Year)
- Edu = Education Level (Year)
- Fam = Number of dependents (people)
- Y = Income (Rupiah)
- Vol = Waste Volume (kg)
- DSex = Gender (1 = Female and 0 = male)
- DWork = Job Type (0 = Informal, 1 = Formal)
- Dloc = Central growth area (1 = Center Tertiary Growth; 2 = Center Secondary Growth; 3 = Center Primary Growth)
- DChar = Characteristics of slums(1 = Slum Weight and 0 = Light and moderate slums).

## **Findings**

This study was dominated by respondents with female gender as much as 65% while men by 35%. This is because in the field research, the respondents most often found were housewives, while men as the head of the family worked outside the home. Marriage Status Distribution of respondents according to marital status shows that respondents with

married status dominate as much as 88%, then respondents with widow / widower status of 7% and respondents with unmarried status are the lowest, which is only 5%.

The distribution of respondents by age. Can be seen in the age range of 45-52 years is the most dominant that is as much as 30%, then the difference of 8% of respondents with an age range of 37-44 years which is as much as 22%, while the least number of respondents are respondents with an age range > 69 years namely only 2%. Thus, most respondents are of productive age. The distribution of respondents according to dependents. Seen in the table that the number of dependents as many as 3 people is the most dominant, which is equal to 34%.

Can be seen that the number of respondents with high school / equivalent education is the most dominating, which is equal to 46%. This is because usually residents living in slums only complete education up to the level of high school education / equivalent alone due to economic factors. It can be seen that the number of respondents based on the type of informal employment is the most, which is 89% compared to formal employment. This is because most respondents and household heads of respondents work as street vendors and sweets (basic food stalls), construction workers, and housewives as in Table 1.

**Table 1. Distribution of respondents according to Income**

Monthly income	Frequency
< Rp. 1.000.000	41
Rp. 1.000.000 - 1.999.999	45
RP. 2.000.000 - 2.999.999	37
Rp. 3.000.000 - 3.999.999	15
Rp. 4.000.000 - 4.999.999	8
Rp. 5.000.000 - 5.999.999	4
<b>Total</b>	<b>150</b>

The distribution of respondents based on income at Rp. 1,000,000-1,999,999 is the most dominating, which is equal to 30%, then the second most respondents are respondents with income ranges of < Rp. 1,000,000 which is 27%.

Respondents with a stay of > 30 years are the most dominant, which is 37%. This means that residents living in these slums have long lived in this area. They occupy a house that is the inheritance or place of residence of the parents who are occupied together, or choose a location with reason for being close to the family. Whereas respondents with 15-20 years of stay are the fewest, which is only 6%.

**Community Willingness in Waste Management**

**Table 2. Distribution of Respondents According to Trash Volumen RT / day**

Waste	Frequency
<1 kg	20
1-1.5 kg	60
1.5-2 kg	50
>2 kg	20
<b>Total</b>	<b>150</b>

Based on Table 2, it can be seen that the distribution of respondents with an average of a lot of household waste per day is the most dominant 1-1.5 kg, which is as much as 40%. Then the lowest with the same distribution of respondents the amount is less than 1 kg and

more than 2 kg which is 13%. However, with this amount of daily household waste, 73 percent or 109 respondents stated that they did not have their own garbage bins in their neighborhoods.

Based on Table 3 the distribution of respondents according to the type of impact felt by respondents due to littering is the most dominant one is odor which is equal to 27% (41 people), followed by floods of 38 people and dirty / dirty as many as 35 people. Thus, it can be said that the respondents felt the negative impact of waste being dumped carelessly. When asked by respondents about knowledge to separate waste, 51% of respondents know about the benefits of separating organic waste from non-organic waste.

**Table 3. Respondent Perception Distribution About the Impact of Waste**

The Impact of Waste	Frekuensi
Flood	38
Many mosquitoes	20
Smell	41
Dirty	35
Damaging the scenery	9
Uncomfortable	7
<b>Total</b>	<b>150</b>

**Table 4. Distribution of respondents according to Use of Waste Separation**

To Use of Waste Separation	Frekuensi
Easy to transport garbage	18
Easy in processing waste	29
Can be used again (recycled) and make it an economical item	31
Don't know the usefulness of garbage separation	72
<b>Total</b>	<b>150</b>

**Table 5. Distribution of Respondents According to the Responsibility of Waste Management**

Responsible	Frekuensi
Local community	92
Government	58
<b>Total</b>	<b>150</b>

Table 5 shows the respondent's answer based on who is more responsible for maintaining environmental cleanliness and helping waste management. Respondents who chose the choice of the local community were the most dominant compared to the government's choice of 61%. That is, respondents are aware of the cleanliness of their own living environment so that they prefer to direct their own communities directly in managing waste and maintaining their living environment. Waste management requires costs so that the community must allocate a number of rupiah to pay for it. 120 people or 80 percent of respondents are willing to pay for waste management. Of the 120 respondents, the amount of rupiah willing to be paid to manage waste is IDR 1,358,000, with an average of IDR 11,223.

**Table 6. Distribution of Respondents by Availability Paying Waste Management**

Availability of Paying Waste Management	Frekuensi
Not willing to pay	29
Willing to pay	121
<b>Total</b>	<b>150</b>

**Table 7. Distribution of Responen According to the Amount of Rupiah Willingness to Pay for Waste Management (Willingnes to pay, WTP)**

WTP	Frekuensi
Rp.5.000	30
Rp.6.000	2
Rp.7.000	2
Rp.8.000	2
Rp.9.000	1
Rp.10.000	51
Rp.11.000	1
Rp.12.000	3
Rp.12.500	1
Rp.15.000	9
Rp.20.000	9
Rp.22.500	1
Rp.25.000	4
Rp.30.000	5
Tidak Bersedia Membayar	29
<b>Total</b>	<b>150</b>

Based on Table 7, it can be seen that the distribution of respondents when viewed from paying WTP respondents who want to pay Rp.10,000 is the most dominant, which is 34%. Respondents were willing to pay Rp.10,000 because it was considered that its affordable value was also enough to help the government in managing waste. However, respondents who were willing to pay Rp. 5,000 were also quite large at 20 percent or 30 people.

### **Affecting Factors Willingness to Pay for Management Rubbish**

#### **Statistical Testing**

#### **1. Variance Test (F-Statistic Test)**

**Table 8. F-Statistic Test Results The Amount of Willing to Pay Smapah (WTP)**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.659E9	8	2.074E8	7.330	.000
Residual	3.169E9	112	2.830E7		
Total	4.828E9	120			

The F test statistic is used to test the effect of independent variables on the dependent variable together (simultaneous). Based on Table 4.18 it can be seen that the calculated F value is greater than the F-table value ( $7.330 > 2.02$ ) and the significance value is  $0.000 < 0.05$ . Because the F-count is greater and the significance value is smaller, it can be concluded that Gender, Education Level, Dependent Amount, Job Type, Revenue, Waste Volume and Characteristics of Growth Centers simultaneously influence the amount of WTP Management Willingness.

**2. Partial Test (t-statistical test)**

The t-statistic test is used to test whether the independent variables are partially dependent on the dependent variable. Based on Table 2, the regression results obtained with a significance value or t table of 1.983 ( $t_{\alpha/2, n-k-1}$ ) as follows:

The t-count value of 1.007 <t-table is 1.983 and the probability value of 0.316 > 0.05 means that H0 is accepted and Ha is rejected. Variable Education Level (Edu) has a positive and not significant effect on the magnitude of WTP. The t-count value of -0.307 <t-table is 1.983 and the probability value of 0.759 > 0.05 means that H0 is accepted and Ha is rejected. Variable Amount of Dependent (Fam) has a negative and not significant effect on the magnitude of PAP.

Value of t count 2.260 <t-table 1.983 and probability value 0.026 <0.05 means that H0 is rejected and Ha is accepted. Work Type Variables (Work) have a positive and significant effect on the magnitude of WTP. This means that there are different jobs in determining the amount of PAPs that must be paid.

Value of t-count 1.694 <t-table 1.983 and probability value 0.093 > 0.05 means that H0 is accepted and Ha is rejected. Income variable (Y) has a positive and not significant effect on the magnitude of WTP. Value of t-count 3.257 <t-table 1.983 and probability value 0.001 <0.05 means that H0 is rejected and Ha is accepted. Variable Waste Volume (Vol) has a positive and significant effect on the magnitude of WTP.

The t-count value is -3.285 <t-table 1.983 and probability value 0.001 <0.05 means that H0 is rejected and Ha is accepted. Location variable (Loc) has a negative and significant effect on the magnitude of WTP. This means that there are differences in influence between locations (loc) according to the category of growth centers on the magnitude of WTP.

The value of t-count is 0.403 <t-table 1.983 and the probability value of 0.687 > 0.05 means that H0 is accepted and Ha is rejected. Sex variable (Sex) has a positive and not significant effect on the magnitude of WTP. This means that there is no difference in influence between sexes (Sex) in paying the amount of WTP.

The value of t-count is 4,916 <t-table 1,983 and probability value is 0,000 <0,05 means that H0 is rejected and Ha is accepted. So from that the Characteristics variable has a negative and significant effect on the magnitude of WTP. This means that there are differences in influence between respondents who live in heavy slums with mild and moderate characteristics in influencing the magnitude of PAPs.

**3. Determination Coefficient Test (R2)**

Table 4.9. **Determination Coefficient Test Results (R2) The amount of WTP**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>
0.586	0.344	0.297

Based on Table 4.9, it can be seen the coefficient of determination (R2) of 0.344 means that Types of Sex (Sex), Education Level (Edu), Amount of Dependent (Fam), Job Type (Work), Income (Y), Volume of Waste (Vol), the location of the growth center (Loc) and

Characteristics of Slums (Characteristic) affect the magnitude of PAPs by 34.4%, while the remaining 65.7% is influenced by other variables outside the research model.

**4. Test of Classical Assumptions**

**a. Normality Test**

The normality test aims to test whether the data regression model is normally distributed or not by comparing the value of Asymp. Sig. (2 tailed) and significance value ( ). Based on Table 4.10, it can be seen the Kolmogorov-Smirnov Z value of  $1.477 > 0.05$ . Thus, there is no difference between the empirical distribution of data and the ideal normal distribution. Therefore the variable service data distribution is normal. While the significance value or value of Asymp. Sig (2 tailed) is  $0.025 < 0.05$ , so there is a difference between the empirical data distribution and the ideal normal distribution, therefore the distribution of satisfaction variable data is not normal.

Table 4.10. Results of Normality Test of Kolmogorov-Smirnov One Sample Test for the magnitude of WTP

		Unstandarized Residual
N		121
Normal Parameters	Mean	.0000000
	Std. Deviation	5.13911125E3
Most Extreme Differences	Absolute	.134
	Positive	.134
	Negative	-.071
Kolmogorov-Smirnov Z		1.477
Asymp. Sig (2 tailed)		.025

**b. Multicollinearity Test**

Multicollinearity test is used to test whether the regression model is found to have a correlation between independent variables. To find out whether there is multicollinearity in this study it is used by using TOL values (tolerance) and Variant Inflation Factor (VIF).

Table 11. Multicollinearity TOL test results and VIF WTP

Variable	Tolerance	VIF
Sex	.824	1.214
Edu	.726	1.378
Fam	.878	1.139
Work	.820	1.219
Y	.587	1.704
Vol	.826	1.211
Loc	.182	5.487
Characteristic	.217	4.602

Table 4.12 shows the overall VIF value of all independent variables is  $< 10$  and the tolerance value of all independent variables  $> 0.10$ . Thus, it can be concluded that in this study there was no multicollinearity.

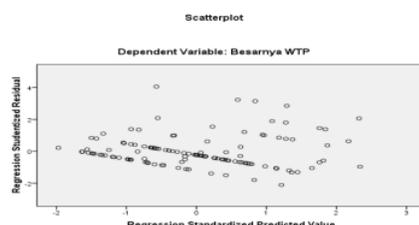
Table 4.12. Multicollinearity Test Results of TOL and VIF Amount of WTP

Variabel	Tolerance	VIF
Jenis Kelamin (Sex)	.824	1.214
Lama Sekolah (Edu)	.726	1.378
Jumlah Tanggungan (Fam)	.878	1.139
Pekerjaan (Work)	.820	1.219
Pendapatan (Y)	.587	1.704
Volume Sampah (Vol)	.826	1.211
Lokasi (Loc)	.182	5.487
Karakteristik (Characteristic)	.217	4.602

### 3. Heteroscedasticity Test

Heteroscedasticity test is used to test whether in the regression model there is an inequality of variance from the residual one observation to the other observations.

Figure 1. Heteroscedasticity Test Results with Graph of Scatterplot Magnitude of WTP



The graph above is used to examine the linearity and relationship between independent and dependent variables. Based on the scatterplot graph above can be seen where the points or plots spread unevenly and form a certain pattern. So it can be concluded that there is a problem of heteroscedasticity.

### Conclusion

Community perceptions of participatory waste management efforts to improve environmental quality in slums are relatively good. It can be seen that as much as 61 percent of respondents answered that the people responsible for waste management were the people themselves. Thus, public awareness of the cleanliness of their own living environment is good enough so that they prefer to own the community which directly goes down in managing waste and protecting the environment.

The level of public acceptance of participatory waste management efforts to improve the quality of the environment in slums is quite good. 120 people or 80 percent of respondents are willing to pay for waste management. Of the 120 respondents, the amount of rupiah willing to be paid to manage waste is Rp. 1,358,000. With monthly contribution of IDR 5,000-10,000 in waste management. Factors that influence the amount of willingness to pay for waste management, namely waste volume has a positive and significant effect, while income, education level, and number of dependents have no significant effect. Likewise with gender, between men and women does not have a significant effect so there is no difference in influence. The types of jobs between formal and informal, locations according to the primary, secondary and tertiary growth center categories and slum characteristics also have different effects on willingness to pay for waste management.

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